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TESLA-SCHERFF PAPERS

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"Nay ladies, fear not;
By all the laws of war you're privileged."

Henry VIII, Act 1, Scene 15.

The Players,

16 Gramercy Park.

The Players request the honor of your company on
the afternoon of Monday, April the twenty third,
from two until six o'clock.

M

with compliments of Mr. Nikola Tesla

1900.

*This card will admit one lady only
and must be signed by a member of the Club.*

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Nikola Tesla,
New York, 1900
Invitation card of the Players Club,
signed by Tesla

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Nikola Tesla, Esq.,

New York City.

May 10th, 1913.

Dear Mr. Tesla:-

I beg to acknowledge receipt of your favor of 7th inst. together with tax report of the Nikola Tesla Company for the year 1912, which I at once forwarded with the Collector of Internal Revenue.

As regards your note for \$500.00, which I received on May 1st, I have tried to have the same extended by the present holder, but have met with opposition. If you could send me a check of two hundred dollars on account, I believe I could persuade the parties to extend the note. Kindly let me know your decision in the matter of the note, so that the note may not go to protest.

Respectfully yours,

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(Tesla, Nikola)
n.p., 10 May 1913
To Nikola Tesla
t.l., 1 p. (Carbon copy of a l.
Tesla's lawyer(?))

21380E

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PROSPECTUS FOR MR. TESLA'S NITRATES COMPANY.

~~Mr. Nikola Tesla, whose~~ *discoveries*
~~more recent practical applications of electricity, and which by~~
~~their world-wide recognition have given this inventor a pre-eminent~~
~~position in the field of electricity, has, by a series of discover-~~
~~ies extending over many years, and all protected by broad patents~~

has evolved
a new and
efficient
process for

the fixation of atmospheric nitrogen, *that is, its chemical combination with*
~~the oxygen of the atmosphere into~~
~~tremendous value and wide-reaching influence, bids fair to outrank~~
~~many times his wonderful invention of the alternating current motor.~~

~~First, that his high-frequency electric discharges in~~
~~the atmosphere give in a much more effective degree a peculiar~~
~~electric chemical stress, which brings about this most difficult~~
~~of combinations; a stress which all workers in this field have~~
~~recognized for years as being one which not only must be of~~
~~tremendous power, but of almost infinite suddenness. The time~~
~~element which has so materially interfered with the success of~~
~~other workers in this field, has, by Mr. Tesla's invention, been~~
~~almost entirely removed as an objection.~~

~~Second, Mr. Tesla's peculiar means of obtaining phenom-~~
~~enally high voltages (running into the millions of volts) from~~
~~apparatus of most moderate dimensions enables him to obtain the~~

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attenuated are so necessary for the highest efficiency.

Third, by virtue of the peculiar nature of Mr. Tesla's transformer, he is enabled to produce a certain tonnage of product with such a small amount of apparatus and a consequently reasonable investment as to multiply a thousand-fold, the capacity efficiency of his plant. This item is of vast importance in connection with this subject. Many experimenters have produced nitric acid from the atmosphere and there are now some very large plants engaged in this industry, one particularly in Norway, that involves upwards of \$50,000,000, and which will absorb some 200,000 horse power when it is fully expanded, but without exception all these efforts have resulted in a first cost of apparatus so great that the interest and maintenance alone thereof puts a fixed charge upon each ton of the product that has heretofore rendered the business indifferently attractive to capital. Ignoring, there-

for the moment, the increased efficiency claimed by Mr. Tesla, or his novel method of burning the atmosphere, and assuming only that he shall burn it as it has been done before by ^{assuming} ~~attenuated~~ ^{that his devices are applied to the old process, the commercial} ~~that his devices are applied to the old process, the commercial~~ ~~advantages secured will still be such as to make the success~~ ~~of the project absolutely certain, if power can be had at a reasonable price, for~~ ~~corresponding expenditure of eight dollars, or less.~~ ~~are pure, sold from \$100 to \$200 per ton, and even the crude~~ ~~impurities, sold for \$55 and better.~~ ~~what a small charge of investment of \$100,000 for a ton of put-~~ ~~put becomes.~~ The operation of these plants, like those of hydro-
electric installations, require but little labor. There is no essential
and care.

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xxxx & Their insurmountable suddenness, removes one great obstacle which has so materially interfered with the success of the old method and appliances.

& Tesla means for generating enormous electrical pressures with apparatus of surprisingly small dimensions, enables the production of discharges of arcs of the great length and volume so necessary to the highest efficiency.

By this means it is possible to operate units of any capacity, however great, to burn the air at any desired rate and thus increase a thousand fold the effectiveness of the plant. The Tesla apparatus may be likened to a turbine running at a stupendous speed, while that ~~now~~ ~~employed~~ is comparable to an old fashioned engine turning slowly. For the same performance the latter is ever so much more cumbersome and expensive. ~~This is a very heavy and costly first cost and fixed charges~~

& This is of vital importance to the enterprise reducing as it does, to a minimum the first cost ^{the burden of} and fixed charges. To illustrate, ~~namely that~~ disregarding xx (other side)

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part ^{of the plant} ~~of the plant~~ subject to rapid ^{deterioration} ~~wear and tear~~; in fact, most of it is ^{good for one hundred years} ~~good for one hundred years~~ consists principally of brick ^{and metal and is good for centuries} ~~buildings, transformers, brick or tile construction chambers and equipping powers or their equivalent~~. The process is a continuous one and once started requires no manual labor, ^{electricity} ~~the electricity~~ continuing to burn the atmosphere into nitric fumes, which in turn combine with water to make nitric acid, and this goes on until the ~~current~~ ^{current} is switched off, and immediately recommences when ^{the} ~~current~~ ^{current} is ~~again~~ ^{switched} on. There is no loss upon the discontinuing of the process for an hour, a day, a month or a year, ^{other than} ~~except~~ that ~~loss~~ ^{the} due to plant lying idle and carrying ^{the smell} ~~its~~ of interest. It is obvious, therefore, that it ~~only remains to obtain power at a sufficiently reasonable price to make an almost unlimited industry of this~~ ^{can be built up} with a very reasonable investment of capital yielding annually a return many times the first cost.

The Tesla Nitrates Company owns the exclusive rights under the United States patents granted to ~~the~~ ^{and} Tesla, applicable to the manufacture of nitrates from the atmosphere, ^{which are the following:} ~~relative to this subject, and we get the benefit of his assistance and advice.~~ ^{It is proposed to immediately make a demonstration of the} ~~on the commercial magnitude in the immediate vicinity of New York City, where experts and investors may see for themselves the practical application of these inventions, in a full sized unit apparatus. In making this test, Mr. Tesla will have at his disposal, a plant that has already cost over \$200,000, a large part of which will be immediately available.~~ ^{It is estimated that this test will involve an expenditure of \$25,000} ~~the test will involve an expenditure of \$25,000~~ ^{will be ample to meet}

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ishing of the additional apparatus, partly for attendance and
 all expenses in the connection. Incidentally the plant will serve
 operation and partly for the very full and exhausted demonstra-
 tion which it is proposed to be made. The latest improvements
 prior to this application on the large scale contemplated.

XXXX Tesla is now devoting himself to
 the perfection of plans for ~~under~~ a large ^{installation} plant
 being erected in this sort by a ~~well known~~
 producer of international repute. ~~who has been for a long time~~
~~has been~~ a long experience in the fixation of Nitrogen
 by the old method and is thoroughly familiar
 with all ~~the~~ facts pertaining to the manufacture
 and sale of the products. In the near
 time X X

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13
The subject you wish to write
about. In order to explain this
phenomenon Einstein has
invented the quantity "lambda"

My theory of gravitation
explains this phenomenon
perfectly

N. T. April 18, 1932

We need a great deal about the
cosmic rays matter being
changed into force and force
being changed into matter
by the cosmic rays. This is
absurd. It is the same as
saying that the body can be
changed into the mind, and the
mind into the body. We know
that the mind is a functioning
of the body, and in the same
manner force is a function of
matter. Without a body there
can be no mind, without matter
there can be no force.

Einstein has for years developed
formulas explaining the mechanism
of the cosmos. In doing this he
overlooked an important factor,
namely the fact, namely that some
of the heavenly bodies are increasing
in distance from the sun. This
is the same as writing for a
business letter and forgetting

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Tesla, Nikola
n.p., 15 Apr 1932
a.m.s.s. (with initials), 2 p. (Statement of
Tesla relating to force and matter, to
Einstein's theories, and Tesla's own
theory of gravitation)

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DICKSON D. ALLEY,
FORMERLY OF TONNIE & CO.
ART PHOTOGRAPHER,
12 EAST 15TH STREET, NEAR 5TH AVENUE.

35

Paintings, &c., copied by the Isochromatic Process.

New York May 26 1903

Dear Mr. Alley,

Sorry I missed you. I want you to take two snaps at my place from the railroad track so that the chimney of the building is just in the center of frame. From a previous photograph taken by one of my assistants it would seem that the best view would be obtained by placing the camera not quite on the end of the central path from ^{railroad} track to building but considerably closer to latter. The camera in my opinion should also be elevated considerably above ground, but this may not be necessary. Please when taking this principal view see that the doors of the building are wide open and the door of the tool room is wide closed and that the two tanks in front of tool room appear symmetrical with respect to door. Also observe that all the windows are down and that the workmen

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Tesla, Nikola
New York, 26 May 1903
To Dickson D. Alley
a.l.s., 2 p.



Apr 1 1936

At the close of 1889, having worked one year in the shops of George Westinghouse, Pittsburgh, I experienced so great a longing for resuming my interrupted investigations that, notwithstanding a very tempting proposition by him, I left for New York to take up my laboratory work. But owing to pressing demands by several foreign scientific societies I made a trip to Europe where I lectured before the Institution of Electrical Engineers and Royal Institution in London and the Societe de Physique in Paris. After this and a brief visit to my home in Yugoslavia I returned to this country in 1892 eager to devote myself to the subject of predilection of my thoughts: the study of the universe.

During the succeeding two years of intense concentration I was fortunate enough to make two far-reaching discoveries. The first was a dynamic theory of gravity, which I have worked out in all details and hope to give to the world very soon. It explains the causes of this force and the motions of heavenly bodies under its influence so satisfactorily that it will put an end to idle speculations and false conceptions, as that of curved space. According to the relativists, space has a tendency to curvature owing to an inherent property or presence of celestial bodies. Granting a semblance of reality to this fantastic idea, it is still self-contradictory. Every action is accompanied by an equivalent reaction and the effects of the latter are directly opposite to those of the former.

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t.ms., 10 pp.
(Some biographical information, but
mainly on his various discoveries)

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Supposing that the bodies act upon the surrounding space causing curvatures of the same, it appears to my simple mind that the curved spaces must react on the bodies and, producing the opposite effects, straighten out the curves. Since action and reaction are co-existent, it follows that the supposed curvature of space is entirely impossible. But even if it existed it would not explain the motions of the bodies as observed. Only the existence of a field of force can account for them and its assumption dispenses with space curvature. All literature on this subject is futile and destined to oblivion. So are also all attempts to explain the workings of the universe without recognizing the existence of the ether and the indispensable function it plays in the phenomena.

My second discovery was a physical truth of the greatest importance. As I have searched the scientific records in more than a half dozen languages for a long time without finding the least anticipation, I consider myself the original discoverer of this truth, which can be expressed by the statement: There is no energy in matter other than that received from the environment. On my 79th birthday I made a brief reference to it, but its meaning and significance have become clearer to me since then. It applies rigorously to molecules and atoms as well as to the largest heavenly bodies, and to all matter in the universe in any phase of its existence from its very formation to its ultimate disintegration.

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Being perfectly satisfied that all energy in matter is drawn from the environment, it was quite natural that when radioactivity was discovered, in 1896 I immediately started a search for the external agent which caused it. The existence of radioactivity was positive proof of the existence of external rays. I had previously investigated various terrestrial disturbances affecting wireless circuits but none of them or any others emanating from the earth could produce a steady sustained action and I was driven to the conclusion that the activating rays were of cosmic origin. This fact I announced in my papers on Roentgen rays and Radiations contributed to the Electrical Review of New York, in 1897. However, as radioactivity was observed equally well in other widely separated parts of the world, it was obvious that the rays must be impinging on the earth from all directions. Now, of all bodies in the Cosmos, our sun was most likely to furnish a clue as to their origin and character. Before the electron theory was advanced, I had established that radioactive rays consisted of particles of primary matter not further decomposable, and the first question to answer was whether the sun is charged to a sufficiently high potential to project such particles and produce the effects noted. This called for a prolonged investigation which culminated in my finding that the sun's potential was 216 billions of volts and that all such large and hot heavenly bodies emit cosmic rays. Through

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Further solar research and observation of Novae this has been proved conclusively, and to deny it would be like denying the light and heat of the suns. Nevertheless, there are still some doubters who prefer to shroud the cosmic rays in deep mystery. One of them declared recently that they must come from very remote regions in which matter is converted into energy. I am sure that this is not true for there is no place where such a process occurs in this or any other universe beyond our ken.

A few words will be sufficient in support of this contention. The kinetic and potential energy of a body is the result of motion and determined by the product of its mass and the square of velocity. Let the mass be reduced, the energy is diminished in the same proportion. If it be reduced to zero the energy is likewise zero for any finite velocity. In other words, it is absolutely impossible to convert mass into energy. It would be different if there were forces in nature capable of imparting to a mass infinite velocity. Then the product of zero mass with the square of infinite velocity would represent infinite energy. But we know that there are no such forces and the idea that mass is convertible into energy is rank nonsense.

While the origin and character of the rays observed near the earth's surface are sufficiently well ascertained, the so-called cosmic rays observed at great altitudes presented

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a riddle for more than 26 years, chiefly because it was found that they increased with altitude at a rapid rate. My investigations have brought out the astonishing fact that the effects at high altitudes are of an entirely different nature, having no relation whatever to cosmic rays. These are particles of matter projected from celestial bodies at very high temperature and charged to enormous electric potentials. The effects at great elevations, on the other hand, are due to waves of extremely small lengths produced by the sun in a certain region of the atmosphere. This is the discovery which I wish to make known. The process involved in the generation of the waves is the following: The sun projects charged particles constituting an electric current which passes through a conducting stratum of the atmosphere approximately 10 kilometers thick enveloping the earth. That is a transmission of energy exactly as I illustrated in my experimental lectures in which one end of a wire is connected to an electric generator of high potential, its other end being free. In this case the generator is represented by the sun and the wire by the conducting air. The passage of the solar current involves the transference of electric charges from particle to particle with the speed of light, this resulting in the production of extremely short and

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penetrating waves. As the air stratum mentioned is the source of the waves it follows that the so-called cosmic rays observed at great altitudes must increase as this stratum is approached. My researches and calculations have brought to light the following facts in this connection: (1) the intensity of the so-called cosmic rays must be greatest in the zenithal portion of the atmosphere; (2) the intensity should increase more and more rapidly up to an elevation of about 20 kilometers where the conducting air stratum begins; (3) from there on the intensity should fall, first slowly and then more rapidly, to an insignificant value at an altitude of about 30 kilometers; (4) the display of high potential must occur on the free end of the terrestrial wire, that is to say, on the side turned away from the sun. The current from the latter is supplied at a pressure of about 216 billion volts and there is a difference of 2 billion volts between the illuminated and the dark side of the globe. The energy of this current is so great that it readily accounts for the aurora and other phenomena observed in the atmosphere and at the earth's surface.

For the time being I must content myself with the announcement of the salient facts, but in due course I expect to be able to give more or less accurate technical

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data relating to all particulars of this discovery.

To go to another subject, I have devoted much of my time during the year past to the perfecting of a new small and compact apparatus by which energy in considerable amounts can now be flashed through interstellar space to any distance without the slightest dispersion. I had in mind to confer with my friend George E. Hale, the great astronomer and solar expert, regarding the possible use of this invention in connection with his own researches. In the meantime, however, I am expecting to put before the Institute of France an accurate description of the devices with data and calculations and claim the Pierre Curie Prize of 100,000 francs for means of communication with other worlds, feeling perfectly sure that it will be awarded to me. The money, of course, is a trifling consideration, but for the great historical honor of being the first to achieve this miracle I would be almost willing to give my life.

My most important invention from a practical point of view is a new form of tube with apparatus for its operation. In 1896 I brought out a high potential targetless tube which I operated successfully with potentials up to 4 million volts from '96 to '98. This device was adopted by many imitators

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and with slight modifications it is employed even now in all research laboratories and scientific institutions here and in other countries, and virtually all atomic investigations are carried on with it. At a later period I managed to produce very much higher potentials up to 18 million volts, and then I encountered unsurmountable difficulties which convinced me that it was necessary to invent an entirely different form of tube in order to carry out successfully certain ideas I had conceived. This task I found far more difficult than I had expected, not so much in the construction as in the operation of the tube. For many years I was baffled in my efforts, although I made a steady slow progress. Finally though, I was rewarded with complete success and I produced a tube which it will be hard to improve further. It is of ideal simplicity, not subject to wear and can be operated at any potential, however high, that can be produced. It will carry heavy currents, transform any amount of energy within practical limits, and it permits easy control and regulation of the same. I expect that this invention, when it becomes known, will be universally adopted in preference to other forms of tubes, and that it will be the means of obtaining results undreamed of before. Among others, it will enable the production of cheap radium substitutes in any desired quantity and will be, in general, immensely more effective in the smashing of

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atoms and the transmutation of matter. I am hopeful that it will be possible by its use to carry out a process in which there should be no misses whatever, but only hits. However, this tube will not open up a way to utilize atomic or sub-atomic energy for power purposes. According to the physical truth I have discovered there is no available energy in atomic structures, and even if there were any, the input will always greatly exceed the output, precluding profitable, practical use of the liberated energy.

Some papers have reported that I had promised to give a full description of my tube and its accessories on the present occasion. This has caused me considerable annoyance, as, owing to some obligations I have undertaken regarding the application of the tube for important purposes, I am unable to make a complete disclosure now. But as soon as I am relieved of these obligations a technical description of the device and of all the apparatus will be given to scientific institutions.

There is one more discovery which I want to announce at this time, consisting of a new method and apparatus for the obtaining of vacua exceeding many times the highest heretofore realized. I think that as much as one-billionth of a micron can be attained. What may be accomplished by means of such vacua is a matter of conjecture, but it is obvious that they will make possible the production of much more intense

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effects in electron tubes. My ideas regarding the electron are at variance with those generally entertained. I hold that it is a relatively large body carrying a surface charge and not an elementary unit. When such an electron leaves an electrode of extremely high potential and in very high vacuum it carries an electrostatic charge many times greater than the normal. This may astonish some of those who think that the particle has the same charge in the tube and outside of it in the air. A beautiful and instructive experiment has been contrived by me showing that such is not the case, for as soon as the particle gets out into the atmosphere it becomes a blazing star owing to the escape of the excess charge. The great quantity of electricity stored on the particle is responsible for the difficulties encountered in the operation of certain tubes and the rapid deterioration of the same.

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THE NEW TESLA ELECTRIC HEATER

STRICTLY CONFIDENTIAL

This device is greatly superior to the usual flat core type in efficiency and other respects. It consists of a thin polished metal tube acting as reflector and a base equipped with switch and connecting terminals and carrying spaced resistor wires concentric with the tube and at a certain distance from the inner surface of the same. In this arrangement the diffuse radiation is virtually eliminated, and the heater operates as if the resistor were not present, the rays being projected from the reflector radially to the central or focal region occupied by the boiling pot.

The principal advantages thus secured are the following:

1. A very high efficiency, as much as 96% being attainable.
2. The efficiency is practically the same whether the pot is large or small since the density of the rays is inversely as the diameter of the vessel.
3. Due to these features the current consumption is hardly more than half of that in the best heaters of the type referred to.
4. The resistor has a relatively much longer life and can be made to last almost indefinitely in some cases. Also less wire can be used if desired.
5. The heat being largely confined to the range, the kitchen remains comparatively cool.
6. Another practical advantage is greater safety from a variety of accidents frequently occurring with ordinary ranges.
7. The new heater is especially adapted for use on shipboard, Pullman cars, aerial vehicles and automobiles.
8. Likewise, it is suitable for all kinds of service on the table, being free from the objections of the present type.
9. It saves considerable time in certain applications.
10. Owing to simplicity, the cost of manufacturing is low.

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THE NEW TESLA ELECTRIC HEATER.

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This device is greatly superior to the usual flat coil type in efficiency and other respects. It consists of a thin polished metal tube acting as reflector and a base equipped with switch and connecting terminals, and carrying spaced resistor wires concentric with the tube and at a certain distance from the inner surface of the same. In this arrangement the diffuse radiation is virtually eliminated, and the heater operates as if the resistor were not present, the rays being projected from the reflector radially to the central or focal region occupied by the boiling pot.

The principal advantages thus secured are the following:

1. A very high efficiency, as much as 96% being attainable.
2. The efficiency is practically the same whether the pot is large or small, since the density of the rays is inversely as the diameter of the vessel.
3. Due to these features the current consumption is hardly more than half of that in the best heaters of the type referred to.
4. The resistor has a relatively much longer life and can be made to last almost indefinitely in some cases. Also less wire can be used if desired.
5. The heat being largely confined to the range, the kitchen remains comparatively cool.
6. Another practical advantage is greater safety from a variety of accidents frequently occurring with ordinary ranges.
7. The new heater is especially adapted for use on shipboard, Pullman cars, aerial vehicles and automobiles.
8. Likewise it is suitable for all kinds of service on the table, being free from the objections of the present type.
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Seventh Chapter.

What my uncle Herse said and what my ~~uncle~~ Herse was; and why Fritz Sahlmann had to whistle.

When the watchman was taken down the castle hill, Fritz Sahlmann had, of course, gone along, only in order to see how the thing would come the prisoner and if he would not perhaps escape, but the latter did not come to pass. The procession moved slowly down to the town-hall, for it had to wind its way through all sorts of teams and wagons, which had been collected from the villages and the town for the transportation of the loot and booty and were now drifting to and fro in the castle-court and on the road to the castle and surrounded by Frenchmen, that they might not again escape, for the old farmers were already devilish smart ~~at~~ ^{at} ~~this~~ ^{game}. - The watchman went along with his two guardians, patient as a lamb and also perfectly calm, for though he had been greatly frightened at first and although the whole affair of last night was very disagreeable and serious for him, during the examination which the adjutant had instituted with him he had come into a frame of mind, which might be described as: "Yes, you talk or! You may say a great deal before a word of it will please me", and his answers had turned out very droll. And although he had not in him that wild courage which is entirely good for everything, he had already been too long in the world and been in a scrape so often, that he did not immediately despair. He let things come as

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they may. "I wonder how this is going to ~~end~~ ^{end}" he said to himself, when he was pushed into the door of the town-hall. -

"Fritz Sahlmann", said ~~the~~ ^{allderman} horse to the boy, when he wanted to go up to the castle again, "what does this mean?" - Fritz Sahlmann tells with the greatest importance the story of yesterday, and that Mr. Drei had slept in Herrselle Westphalian's room and had broken up everything; and how he himself had dropped and broken the chief-magistrate's pipe, - but he could not help it, it was Fiken's fault - and that the colonel had wanted to steal the chief magistrate and how Herrselle Westphalian was sitting in the kitchen, a picture of despair; but about the lump of iron he said nothing.

Now my uncle, ~~the~~ ^{allderman} horse, was immensely patriotic, even if only in secret. And that had its reason. For as he wispered to me long years afterwards, when Bonaparte was already dead, he used to belong at this time to the League of Virtue. And I do believe him, because when he was in company he would always play with a long watch chain of very light hair - and Herrselle's was black - and he would always show a dangerously big iron ring finger - ring, with which he had once almost beaten that villain Huepner, a journeyman locksmith, to death, when he had behaved in a very impolite manner in the court room. - "Fritz", he said to me later, "this hair is from a French maiden, who at thirteen had

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her head shorn for the fatherland, and this iron ring has cost me my gold one. But do not speak of it, I do not like it." Therefore he was at the time when this story happened, with good reason such for secrecy. It is possible, too, that his way and manner of looking over everything together from a distant point of view had much to do with his leaning towards secrecy, for while my father had to harass himself day and night with the most trifling drudgery and toil, in order that the little old needy community as it barely remain hanging together and would not go to pieces altogether entirely, ~~herse~~ *alderman* herse would let Kutosow march to the right and Czernitelaw to the left, praise work and speak about suelow, he did not understand his business, for he should not have moved to Berlin, but to the right as far as Stemann and rushed into Bonaparte's flank. In short, he was just the right sort of a man to turn a sneeze into a thunderclap. In every innocent French corporal he saw a Corsican tyrant, and in on some blue Monday at a workmen's row constable Luth had received a few blows too, then he would carry on, "if the Duke of No-Business had been treated to a slap in the face."

"Hold your tongue, boy!" *alderman* herse whispered very seriously, "do you want to cry out your death sentence here in the public market place? - For the wretched life I would not give a single roschen, because it is certain that the Miller and his Frederick have killed the chancellor ..." - "Not the Miller", Fritz

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This device is greatly superior to the usual flat coil type in efficiency and other respects. It consists of a thin polished metal tube acting as reflector and a wire equipped with switch and connecting terminals and carrying spaced resistor wires concentric with the tube and at a certain distance from the inner surface of the same. In this arrangement the diffuse radiation is virtually eliminated and the heater operates as if the resistor wires were not present, the rays being projected from the surface radially to the central or focal region occupied by the boiling pot.

The principal advantages thus secured are the following:

1. A very high efficiency, as much as 96% being attainable.

2. The efficiency is practically the same whether the pot be large or small since the density of the rays is inversely as the distance from the source.

3. Due to these features the current consumption

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is hardly more than half of that in the best heaters of the type referred to.

4. The resistor has a relatively much longer life and can be made to last almost indefinitely in some cases. Also low wire can be used if desired.

5. The heat being largely confined to the range, the kitchen remains comparatively cool.

6. Another practical advantage is greater safety from a variety of accidents frequently occurring with ordinary ranges.

7. The new heater is especially adapted for use on shipboard, Pullman cars, aerial vehicles and automobiles.

8. Likewise, it is suitable for all kinds of service on the table, being free from the objection of the present heaters.

9. It saves considerable time in certain applications.

10. Owing to simplicity the cost of manufacture is low.

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is hardly more than half of that in the best heaters of the type referred to.

4. The resistor has a relatively much longer life and can be made to last almost indefinitely in some cases, when care is taken of details.

5. The heater being largely compact, it is well adapted to kitchen recesses comparatively small.

6. Another practical advantage is greater safety from a variety of accidents frequently occurring with ordinary ranges.

7. The new heater is especially adapted for use on shipboard, for motor cars, aerial operation and automobiles.

8. Likewise, it is suitable for all kinds of service on the land, being free from the objections of the present heater.

9. It saves some trouble here in certain applications.

10. Going to simplicity the cost of construction is low.

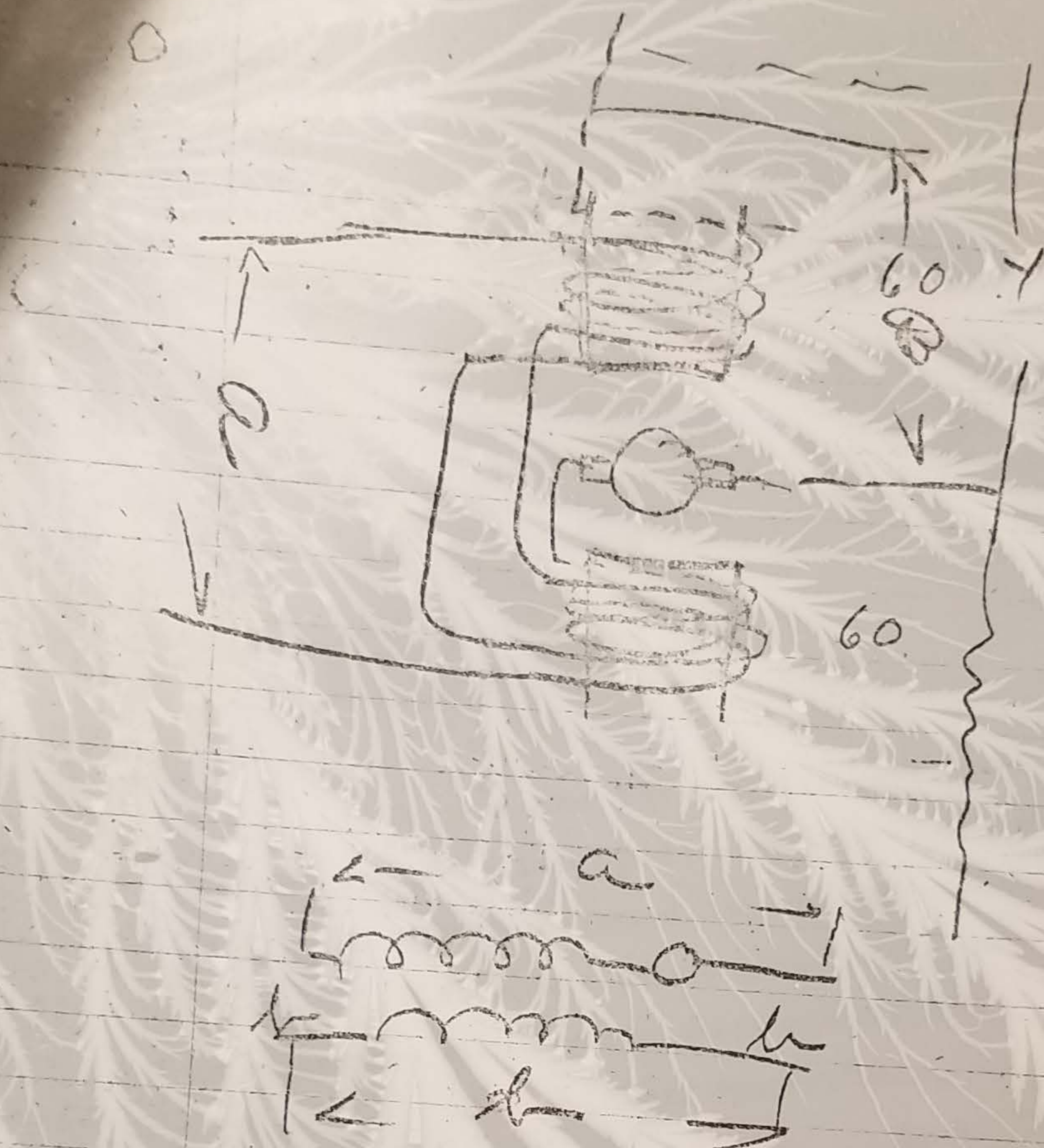
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Wind field coils with two wires - winding both at the same time. One set of field windings to be connected in series, see circuit A, and from Armature also brought out. The other set of field windings should be connected in series with the armature, see circuit B. See circuit to take 1/20 ampere or 60 volts.

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We have your favor of the 16th inst., which confirms telephone instructions to ship to you 2500 ft. of #8 B&SG. rubber insulated and lead covered cable.

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MECHANICAL THERAPY

BY

NIKOLA TESLA

In order to convey a clear idea of the significance and revolutionary character of this discovery it is indispensable to make a brief statement regarding ELECTRICAL THERAPY.

Fifty years ago, while investigating high frequency currents developed by me at that time, I observed that they produced certain physiological effects offering new and great possibilities in medical treatment. My first announcement spread like fire and experiments were undertaken by a host of experts here and in other countries. Then a famous French physician, Dr. D'Arsonval, declared that he had made the same discovery, a heated controversy relative to priority was started. The French, eager to honor their countryman, made him a member of the Academy, ignoring entirely my earlier publication. Resolved to take steps for vindicating my claim, I went to Paris, where I met Dr. D'Arsonval. His personal charm disarmed me completely and I abandoned my intention, content to rest on the record. It shows that my disclosure antedated his and also that he used my apparatus in his demonstrations. The final judgment is left to posterity.

Since the beginning, the growth of the new art and industry has been phenomenal, some manufacturers turning out daily hundreds of sets. Many millions are now in use throughout the world. The currents furnished by them have proved an ideal tonic for the human nerve system. They promote heart action and digestion, induce healthful sleep, rid the skin of destructive exudations and cure colds and fever by the warmth they create. They vivify atrophied or paralyzed parts of the body, allay all kinds of suffering and save annually thousands of lives. Leaders in the profession have assured me that I have done more for humanity by this medical treatment than by all my other discoveries and inventions. Be that as it may, I feel certain that the MECHANICAL THERAPY, which I am about to give to the world, will be of incomparably greater benefit. Its discovery was made accidentally under the following circumstances.

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Mechanical Therapy
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I had installed at the laboratory, 35 South Fifth Avenue, one of my mechanical oscillators with the object of using it in the exact determination of various physical constants. The machine was bolted in vertical position to a platform supported on elastic cushions and, when operated by compressed air, performed minute oscillations absolutely isochronous, that is to say, consuming rigorously equal intervals of time. So perfect was its functioning in this respect that clocks driven by it indicated the hour with astronomical precision. One day, as I was making some observations, I stepped on the platform and the vibrations imparted to it by the machine were transmitted to my body. The sensation experienced was as strange as agreeable, and I asked my assistants to try. They did so and were mystified and pleased like myself. But a few minutes later some of us, who had stayed longer on the platform, felt an unspeakable and pressing necessity which had to be promptly satisfied, and then a strenuous truth dawned upon me. Evidently, these isochronous rapid oscillations stimulated powerfully the peristaltic movements which propel the food-stuffs through the alimentary channels. A means was thus provided whereby their contents can be perfectly regulated and controlled at will, and without the use of drugs, specific remedies or internal applications whatever.

When I began to practice with my assistants MECHANICAL THERAPY we used to finish our meals quickly and rush back to the laboratory. We suffered from dyspepsia and various stomach troubles, biliousness, constipation, flatulence and other disturbances, all natural results of such irregular habit. But after only a week of application, during which I improved the technique and my assistants learned how to take the treatment to their best advantage, all these forms of sickness disappeared as by enchantment and for nearly four years, while the machine was in use, we were all in excellent health. I cured a number of people, among them my great friend

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- 3 -

Mark Twain whose books saved my life. He came to the laboratory in the worst shape suffering from a variety of distressing and dangerous ailments but in less than two months he regained his old vigor and ability of enjoying life to the fullest extent. Shortly after, a great calamity befall me: my laboratory was destroyed by fire. Nothing was insured and the loss of priceless apparatus and records gave me a terrific shock from which I did not recover for several years. The enforced discontinuance of my MECHANICAL THERAPY also caused me deep regret. I had evolved a wonderful remedy for ills of incalculable value to mankind and invented apparatus offering unbounded commercial possibilities but when I came to consider practical introduction I realized that it was entirely unsuitable. It was big, heavy and noisy, called for a continuous supply of oil, part of which was discharged in the room as fine spray; it consumed considerable power and required a number of objectionable accessories. During the succeeding years I made great improvements and finally evolved a design which leaves nothing to be desired. The machine will be very small and light, operate noiselessly without any lubricant, consume a trifling amount of energy and will be, to my knowledge, the most beautiful device ever put on the market. The intention is to exhibit it in action at the occasion of my annual reception in honor of the Press which has been, unfortunately, delayed this year, and I anticipate that it will elicit great interest and receive wide publicity. Unless I am grossly mistaken it will be introduced very extensively and, eventually, there will be one in every household.

The practical application of MECHANICAL THERAPY through my oscillators will profoundly affect human life. By insuring perfect regularity of evacuations the body will function better in every respect

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and life will become ever so much safer and more enjoyable. One of the most important results will be the great reduction -- amounting possibly to seventy-five per cent -- in the number of heart failures, which are mostly caused by some acute upset of the digestive process and normal operation of the stomach. Further vital improvement will be derived from the quickened removal of toxic excretions of organs affected by disease. It is reasonable to expect that through this and other healthful actions ulcers and similar internal lesions or abscesses will be cured and relief might be obtained even in case of a cancer or other malignant growth. Skilled physicians and surgeons will be able to perform veritable miracles with such oscillations. They stimulate strongly the liver, spleen, kidneys, bladder and other organs and by these desirable actions they must contribute not a little to well-being. Persons suffering from anemia of any form will be especially helped by the treatment. But the greatest benefit will be derived from it by women who will be able to reduce without the usual tantalizing abstinence, privation, sacrifice of time and money and torture they have to endure. They will improve much in appearance, acquire clear eyes and complexions and it may be safely predicted that long continued treatment will bring forth feminine beauty never seen before. It is not to be forgotten that the elimination of countless drugs, patent medicines and specific remedies of all kinds taken internally, by which millions of people doom themselves to an early grave, will be of untold good to humanity.

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COMMISSIONER.
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State of New York.
Comptroller's Office.

OFFICE OF
CORPORATION TAX COMMISSIONER,
257 Broadway, New York City.

New York.

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To *Nikola Tesla Co.*
Babylon D.D.
Waldorf Astoria Hotel City

Dear Sirs:--I am commissioned by the Comptroller of the State of New York to examine the above named Company relative to taxation.

This matter has been set down for hearing on the day of *Dec* 190 *7*, at *11:30*. The President, Secretary or Treasurer, or, in their absence, the New York Manager of the Company, is required to appear for examination at that time. In case of failure to attend and give evidence in this matter, the company will be taxed, on the maximum amount, on information in possession of the department.

Revision of each assessment can be had at the office of this department in Albany, on proper application.

Respectfully yours,

Wallace S. Fraser

Corporation Tax Commissioner.

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My dear Mr. Buell,

Many thanks for the tablets, I think they are good. As to the nose douche I have a horror of it such that I would rather go to Hades than to the Elysium if it were at the price.

Enclosed forward article roasting my illustrious friend Sir William Crookes as is running water out by mill. I will drop the adjective - "distinguished" would not do. Luke is mistaken, this is literary style. Crookes is not distinguished, he is illustrious.

I have not forgotten the text to be furnished in improved and finished form. Was it for June of this or next year? Please tell my friend Luke that I expect to send it to-morrow.

Sincerely

H. Tesla.

MR. TESLA SPEAKS OUT

To the Editor of The World:

Permit me a few words of comment relative to The World editorial of Oct. 21 in which I am directly concerned.

Edison's work on the incandescent lamp and direct-current system of distribution was more like the performance of an extraordinarily energetic and horse-sensad pioneer than that of an inventor; it was prodigious in amount, but not creative. The lamp itself, consisting of a carbon filament in an exhausted globe, was well known and even patented years before Crookes had employed incandescent conductors with leading-in platinum wires sealed in the glass and obtained extremely high vacua; the multiple-arc arrangement was frequently shown at institutions of learning, display windows and exhibitions with Geissler tubes; electric generators had been constructed, means for regulating current and voltage described, and canalization of electricity was as obvious as that of water, gas, compressed air or other commodity.

Irrespective of this, however, his primitive scheme of lighting was subject to fatal economic limitations and could have never proved a commercial success in competition. Indeed, during the past thirty-five years it has been almost wholly displaced by a more practical and efficient system based on my rotating magnetic field, a discovery which even hard-headed engineers and patent lawyers have declared to be "one of the greatest triumphs of the human mind." To convey an idea of the extent of its use I only need to quote Dr. B. A. Behrend, one of the foremost electrical experts, who in his book on the induction motor says: "Were we to eliminate from our industrial world the results of Mr. Tesla's work the wheels of industry would cease to turn, our electric trains and cars would stop, our towns would be dark, our mills dead and idle. So far-reaching is this work that it has become the warp and woof of industry."

Edison and his associates bitterly opposed the introduction of my system, raising a clamor against the "deadliness" of the alternating current, which proved very effective and led to the adoption of a commercial type of machine in the electrocution of criminals, an apparatus monstrously unsuitable, for the poor wretches are not despatched in a merciful manner but literally roasted alive. To the observer their sufferings seem to be of short duration; it must be borne in mind, though, that an individual under such conditions, while wholly bereft of the consciousness of the lapse of time, retains a keen sense of pain, and a minute of agony is equivalent to that through all eternity.

Had the Edison companies not finally adopted my invention they would have been wiped out of existence, and yet not the slightest acknowledgment of my labors has ever been made by any of them, a most remarkable instance of the proverbial unfairness and ingratitude of corporations. But the reason is not far to seek. One of their prominent men told me that they are spending \$10,000,000 every year to keep Edison's name before the public, and he added that it is worth more to them.

Of course, in all that unceasing and deafening shouting from the house-tops any voice raised to apprise people of the real state of things is like the chirp of a little sparrow in the roar of Niagara. So it comes that very few have a clear idea of the situation.

In truth, my system has not only provided energy for all purposes throughout the world but also revolutionized electric lighting and made it a great commercial success by reducing the cost of power and increasing enormously the distance of transmission. The greater part of the \$60,000,000,000 which, according to President Hoover's statement, represented the value of electric business, can be traced to my system and its effect on the lighting and other industries. In view of this I feel that I also have done much to dispel darkness. Surely, my system is more important than the incandescent lamp, which is but one of the known electric illuminating devices and admittedly not the best. Although greatly improved through chemical and metallurgical advances and skill of artisans, it is still inefficient, and the glaring filament emits hurtful rays responsible for millions of bald heads and spoiled eyes. In my opinion, it will soon be superseded by the electrodeless vacuum tube which I brought out thirty-eight years ago, a lamp much more economical and yielding a light of indescribable beauty and softness. The technical resources of that time were inadequate to make it a practical success, but most of the difficulties will be overcome when cheap quartz glass becomes available.

No amount of praise is too much to bestow upon Edison for his vigorous pioneer work, but all he did was wrought in known and passing forms. What I contributed constitutes a new and lasting addition to human knowledge. Like his lamp, my induction motor may be discarded and forgotten in the continuous evolution of the arts, but my rotating field with its marvelous phenomena and manifestations of force will live as long as science itself.

NIKOLA TESLA

New York, Nov. 5.

COLUMBIA UNIVERSITY

N.Y. WORLD

NOV. 9, 1929

P. 10

C. 45

card 38

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Mr Tesla Speaks out
7/11. Jan 60

To the Editor of the World:

Permit me a few words of comment relative to your editorial of October 21st in which I am directly concerned.

Edison's work on the incandescent lamp and direct current system of distribution was more like the performance of an extraordinarily energetic and horse-sensed pioneer than that of an inventor; it was prodigious in amount, but not creative. The lamp itself, consisting of a carbon filament in an exhausted globe, was well known and even patented years before; Crookes had employed incandescent conductors with leading-in platinum wires sealed in the glass and obtained extremely high vacua; the multiple arc arrangement was frequently shown at institutions of learning, display windows and exhibitions with Geissler tubes; electric generators had been constructed, means for regulating current and voltage described and canalization of electricity was as obvious as that of water, gas, compressed air or other commodity. Irrespective of this, however, his primitive scheme of lighting was subject to fatal economic limitations and could have never proved a commercial success in competition. Indeed, during the past thirty-five years it has been almost wholly displaced by a more practical and efficient system based on my rotating magnetic field, a discovery which even hard-headed engineers and patent lawyers have declared to be "one of the greatest triumphs of the human mind." To convey an idea of the extent of its use, I only need to quote Dr B.A. Behrend, one of the foremost electrical experts, who in his book on the induction motor says: "Were we to eliminate from our industrial world the results of Mr Tesla's work, the wheels of industry would cease to turn, our electric trains and cars would stop, our towns would be dark, our mills dead and idle. So far-reaching is this work that it has become the warp and woof of industry."

Edison and his associates bitterly opposed the introduction of my system, raising a clamor against the "deadliness" of the alternating current, which proved very effective and led to the adoption of a commercial type of machine in the electrocution of criminals, an apparatus monstrously unsuitable, for the poor wretches are not dispatched in a merciful manner but literally roasted alive. To the observer their sufferings seem to be of short duration; it must be borne in mind though, that an individual under such conditions, while wholly bereft of the consciousness of the lapse of time, retains a keen sense of pain, and a minute of agony is equivalent to that through all eternity.

Had the Edison companies not finally adopted my invention, they would have been wiped out of existence, and yet not the slightest acknowledgment of my labors has ever

FROM
COLUMBIA
UNIVERSITY
TO NEW YORK
NOV. 5, 1929
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been made by any of them, a most remarkable instance of the proverbial unfairness and ingratitude of corporations. But the reason is not far to seek. One of their prominent men told me that they are spending ten million dollars every year to keep Edison's name before the public, and he added that it is worth more to them. Of course, in all that unceasing and deafening shouting from the housetops, any voice raised to apprise people of the real state of things is like the chirp of a little sparrow in the roar of Niagara. So it comes that very few have a clear idea of the situation. In truth, my system has not only provided energy for all purposes throughout the world, but also revolutionized electric lighting and made it a great commercial success by reducing the cost of power and increasing enormously the distance of transmission. The greater part of the sixty billions of dollars which, according to President Hoover's statement, represented the value of electric business, can be traced to my system and its affect on the lighting and other industries. In view of this I feel that I also have done much to dispel darkness. Surely, my system is more important than the incandescent lamp, which is but one of the known electric illuminating devices and admittedly not the best. Although greatly improved through chemical and metallurgical advances and skill of artisans, it is still inefficient and the glaring filament emits hurtful rays responsible for millions of bald heads and spoiled eyes. In my opinion, it will soon be superseded by the electrodeless vacuum tube which I brought out thirty-eight years ago, a lamp much more economical and yielding a light of indescribable beauty and softness. The technical resources of that time were inadequate to make it a practical success, but most of the difficulties will be overcome when cheap quartz glass becomes available.

No amount of praise is too much to bestow upon Edison for his vigorous pioneer work, but all he did was wrought in known and passing forms. What I contributed constitutes a new and lasting addition to human knowledge. Like his lamp, my induction motor may be discarded and forgotten in the continuous evolution of the arts, but my rotating field with its marvelous phenomena and manifestations of force will live as long as science itself.

New York, November 5, 1923.

Nikola Tesla
No 8 West 40th St
N.Y.C.

16
10
/ 62

New York, July 12th, 1900.

46 & 48 East Houston Street.

Rev. William E. Davenport,

Italian Mission,

29 Front Str., Brooklyn, N. Y.

Reverend Sir:-

In reply to your note to the Century Magazine, which has been forwarded to me through the courtesy of the Editor, I beg to say that I shall be at your service any time during the day, at my office, above address.

Yours respectfully,

A. Tesla

FROM
COLUMBIA UNIVERSITY
card 32

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Es ist unmoeglich Ihrem hoefflichen Ansuchen, ~~gemacht~~ bei
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Zeit und, ~~auch~~ ^{Leider!} die Kleinheit der Verwirklichungen ~~in schmerzlich~~
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und Absonderung der uebertragenen Energie; und, drittens, die Fest-
stellung der Gesetze der Fortpflanzung von Stromen durch die Erde

DIE UEBERTRAGUNG ELEKTRISCHER ENERGIE OHNE DRAHT.

(Mitgeteilt an Electrical World and Engineer, 5 Maerz, 1904.)

Von Nikola Tesla.

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und die Atmosphäre. Verschiedene Gründe, von denen nicht der geringste die mir von meinem Freunde Leonard E. Curtis und der Colorado Springs Electric Company angebotene Hilfe war, bewogen mich, fuer meine experimentellen Untersuchungen das grosse Plateau, zwei tausend Meter ueber der Meeresflaeche, in der Naehc dieses reizenden Kurortes zu waehlen, welchen ich spaet im Mai 1899 erreichte. Kaum war ich einige Tage dort gewesen, als ich mich schon zu der gluecklichen Wahl gratulieren konnte, und ich begann die Aufgabe, fuer welche ich mich lange geschult hatte, mit dankbarem Sinne und voll begeisternder Hoffnung. Die vollkommene Reinheit der Luft, die unvergleichliche Schoenheit des Himmels, der erhabene Anblick einer hohen Gebirgskette - alles rund umher trug dazu bei, die Bedingungen fuer wissenschaftliche Beobachtungen ideal zu machen. Dazu kam noch der belebende Einfluss eines herrlichen Klimas und eine eigenartige Verschaeerfung der Sinne. Die Organe unterziehen sich in jenen Regionen merklichen physikalischen Veraenderungen. Die Augen nehmen eine ausserordentliche Klarheit an, was die Sehkraft verbessert; die Ohren troeknen aus und werden empfindlicher gegen Schall. Man kann dort Gegenstaende auf soch grosse Entfernungen unterscheiden, dass ich vorziehe, diese von jemand anders nennen zu lassen, und ich habe - dies kann ich zu bezeugen wagen - sieben und acht hundert Kilometer weit entfernte Donnerschlaege gehoert. Ich haette sie auf noch groessere Entfernungen hoeren koennen, wenn es nicht langweilig gewesen waere, die Ankunft der Laute,

die nach bestimmten Zwischenraeumen erfolgte, genau wie sie - fast eine Stunde im Voraus - von einem elektrischen Anzeigeapparat angekündet wurde, zu erwarten.

In der Mitte des Monats Juni, waehrend Vorbereitungen auf andere Arbeit vor sich gingen, stellte ich einen meiner Empfangstransformatoren auf in der Absicht, auf eine neue Weise, experimentell, das elektrische potentiell der Erdkugel zu bestimmen und dessen periodische und gelegentliche Schwankungen zu beobachten. Dies war ein Teil eines sorgfaeltig im Voraus entworfenen Planes. Eine hoechst empfindliche, sich selbst wiederherstellende Vorrichtung, welche ein registrierendes Instrument kontrollierte, war in den sekundaren Stromkreis eingeschaltet, waehrend die Primaere mit der Erde und mit einem erhobenen Pol von regulierbarer Kapazitaet verbunden war. Die Variationen des Potentiells verursachten elektrische Wogungen in der Primaere; diese erzeugten sekundare Stroeme, die wiederum auf die empfindliche Vorrichtung und den Registrator im Verhaeltnis zu ihrer Intensitaet einwirkten. Es stellte sich heraus, dass die Erde buchstaeblich mit elektrischen Schwingungen belebt war, und bald war ich fast gaenzlich in dieser interessanten Forschung vertieft. Bessere Gelegenheiten zu solchen Beobachtungen wie ich zu machen beabsichtigte koennten nirgends gefunden werden. Colorado ist ein Land, das wegen der Entfaltung natuerlicher elektrischer Kraft beruehmt ist. In der trockenen und verduennten Atmosphaere scheint die Sonne mit gruenniger Intensitaet

auf die Gegenstände herab. Ich entwickelte Dampf bis auf einen gefährlichen Druck in mit konzentrierter Salzlosung gefüllten Faessern, und die Staniolaeberzuege einiger meiner erhöhten Pole schrumpften in der feurigen Glut zusammen. Ein experimenteller Hochspannungstransformator, der unvorsichtigerweise den Strahlen der untergehenden Sonne ausgesetzt worden war, wurde durch das Herausschmelzen der Isolationsmischung verderben. Die Trockenheit und Duemtheit der Luft traegt dazu bei, dass das Wasser wie in einem Kessel verdampft, und statische Elektricitaet entwickelt sich in grosser Menge. Blitzentladungen sind demgemaess sehr Haeufig und mitunter von unbegreiflicher Heftigkeit. Bei einer Gelegenheit fanden in zwei Stunden annaehernd zwei tausend Entladungen statt, und alle in einem Radius von gewiss weniger als fuenfzig Kilometer vom Laboratorium. Viele derselben glichen riesenhaften Baeumen aus Feuer mit den Staemmen nach oben oder unten. Kugelblitze habe ich nicht gesehen, aber als Belohnung fuer meine Enttaeuschung gelang es mir spaeter, die Art ihrer Bildung zu bestimmen und sie kuenstlich zu erzeugen.

Am Ende desselben Monats bemerkte ich mehrere Male, dass meine Instrumente durch Entladungen, die in grosser Entfernung stattfanden, staerker beeinflusst wurden, als durch solche in der Naehel. Das war fuer mich ein grosses Raetsel. Was war die Ursache? Eine Reihe von Beobachtungen bewies, dass es nicht von dem Unterschiede in der Intensitaet zwischen den einzelnen Entladun-

gen hervorgehen konnte, und ich stellte leicht fest, ~~und ich stellte~~
~~leicht fest~~, dass das Phänomen nicht das Resultat eines variieren-
den Verhältnisses zwischen den Perioden meiner Empfängerstromkrei-
se und denen der irdischen Störungen war. Eines Abends, als ich
mit einem Assistenten heimging und ueber diese Erfahrungen nach-
sann, ueberwältigte mich ploetzlich ein Gedanke. Vor Jahren, als
ich ein Kapitel meines Vortrages vor dem Franklin Institute und
der National Electric Light Association schrieb, war er mir auch
eingefallen, aber ich hatte ihn als absurd und unmoeglich verworfen.
Ich verbannte ihn wieder. Mein Instinkt war jedoch wach gerufen,
und ich fuehlte irgendwie, dass ich mich einer grossen Offenbarung
naeherte.

Es war am dritten Juli - das Datum werde ich nie vergessen -
als ich den ersten entscheidenden, experimentellen Beweis einer
Wahrheit von ueberwältigender Wichtigkeit fuer den Fortschritt der
Menschheit erhielt. Eine dunkle, stark geladene Wolkenmasse sam-
melte sich im Westen. Gegen Abend brach ein heftiges Gewitter los,
welches, nachdem es einen beträchtlichen Teil seiner Gewalt in den
Bergen von sich gegeben hatte, mit grosser Geschwindigkeit ueber
die Ebene dahingejagt wurde. Dicke und lang anhaltende Bogen bil-
deten sich in fast regelmaessigen Zwischenraeumen. Meine Beobach-
tungen waren nun sehr erleichtert, und die schon gewonnenen Erfah-
rungen machten sie genaue. Ich war instande, meine Instrumente
schnell zu manipulieren und ich war vorbereitet. Da der Registrier-

apparat richtig adjustiert war, wurden seine Anschlaege mit der zunehmenden Entfernung des Gewitters schwaecher und schwaecher, bis sie gaenzlich aufhoerten. Ich beobachtete in begieriger Erwartung. Und wirklich, nach einer kleinen Weile fingen die Anschlaege wieder an, wurden staerker und staerker und, nachdem sie ein Maximum ueberschritten hatten, wurden sie allmaehlich schwaecher und hoerten wieder auf. Viele Male wiederholten sich dieselben Wirkungen in regelmaessig wiederkehrenden Zwischenraeumen bis der Sturm, der, wie einfache Berechnungen erwiesen, sich mit fast gleichmaessiger Geschwindigkeit bewegte, sich auf eine Entfernung von etwa dreihundert Kilometer zurueckgezogen hatte. Und auch dann liessen diese seltsamen Wirkungen noch nicht nach, sondern fuhren fort, sich mit unverminderter Staerke zu offenbaren. Spaeter wurden aehnliche Beobachtungen auch von meinem Assistenten, Herrn Fritz Loewenstein, gemacht, und kurz nachher boten sich mehrere vortreffliche Gelegenheiten dar, die das wirkliche Wesen des wunderbaren Phaenomens noch kraeftiger und unverkennbar an den Tag brachten. Es blieb kein Zweifel; Ich beobachtete stehende Wellen.

Indem die Quelle der Stoerungen sich fortbewegte, kam der Empfaengerstromkreis nacheinander auf ihre Knoten- und Bauchpunkte. So unmoeglich es auch schien, verhielt sich dieser planet, trotz seines gewaltigen Umfanges, wie ein Leiter von beschraenkten Dimensionen. Die ungeheure Bedeutung dieser Tatsache fuer die Uebertragung von Energie nach meinem System war mir schon ganz klar gewor-

den. Nicht nur war es möglich, ohne Draht telegraphische Botschaften nach irgendeiner Entfernung zu senden, was ich schon vor langer Zeit erkannt hatte, sondern auch die schwachen Modulationen der menschlichen Stimme konnten der ganzen Erdkugel aufgeprägt werden, und vielmehr noch, man konnte Kraft in unbegrenzten Quantitäten auf jede beliebige irdische Entfernung und fast ohne Verlust uebertragen.

Mit diesen erstaunlichen Moeglichkeiten in Aussicht, mit dem experimentellen Beweise vor mir, dass ihre Verwirklichung von nun an nur eine Frage von Fachkenntnis, Geduld und Geschicklichkeit war, nahm ich die Entwicklung meines Sendemultiplikators kraeftig in Angriff, jetzt jedoch nicht so sehr mit der urspruenglichen Absicht, einen solchen von grosser Kraft zu erzeugen, sondern vielmehr zu dem Zwecke, den besten konstruieren zu lernen. Dies ist im Wesentlichen ein Stromkreis sehr hoher Selbstinduktion und geringen Widerstandes, den man wol einem typischen, in der Telegraphie mit Hertz'schen oder elektromagnetischen Wellen benutzten Stromkreise als gerade entgegengesetzt bezeichnen kann. Es ist schwer, sich von der wunderbaren Kraft dieser eigenartigen Vorrichtung einen Begriff zu machen. Da die elektromagnetischen Strahlungen auf eine unbedeutende Quantitaet herabgesetzt und richtige Resonanzverhaeltnisse aufrecht erhalten werden, wirkt der Stromkreis wie ein ungeheures Pendulum, indem er die primaeren Erregerimpulse unbegrenzt aufspeichert und der Erde und ihrer leitenden Atmosphaere gleich-

foermige harmonische Schwingungen aufpraegt, deren Intensitaeten, wie wirkliche Versuche gezeigt haben, so weit getrieben werden koennen, dass sie diejenigen, welche bei der natuerlichen Entfaltung statischer Elektricitaet erreicht worden, uebertreffen.

Gleichzeitig mit diesen Bestrebungen wurden auch die Mittel der Individualisierung und Absonderung der Energie allmaechlich verbessert. Grosse Wichtigkeit wurde dieser Arbeit beigemessen, denn es fand sich, dass einfaches Abstimmen nicht hinreichte, um den strengen praktischen Erfordernissen gerecht zu werden. Die fundamentale Idee, zum Zwecke der Absonderung der uebertragenen Energie eine Anzahl absonderlicher, kooperativ vereinigter Elemente anzuwenden, fuehre ich direkt auf meine Lektuere von Spencer's klarer und anregender Auslegung des menschlichen Nervenmechanismus zurueck. Welchen Einfluss dieses Prinzip auf die Uebertragung von Intelligenz und elektrischer Energie im Allgemeinen haben wird, kann jetzt noch nicht abgeschaezt werden, denn die Kunst ist noch im Keimzustande; aber die gleichzeitige Uebermittlung von tausenden von telegraphischen oder telephonischen Botschaften durch einen einzigen Leitungskanal, sei er natuerlich oder kuenstlich, ohne gefaehrliche gegenseitige Stoerung, ist gewiss ~~unmoeglich~~ moeglich, waehrend Millionen moeglich sind. Andererseits kann durch Anwendung einer grossen Anzahl kooperativer Elemente und willkuerliche Absonderung ihrer absonderlichen Eigenschaften und ihrer Reihenfolge ~~irgen~~ ein beliebiger Grad der Individualisierung erreicht werden. Aus augenscheinli-

chen Gruenden wird dieses Prinzip auch fuer die Erweiterung der Uebertragungsentfernung von Wert sein.

Der Fortschritt, obgleich notwendigerweise langsam, war bestaendig und sicher, denn die Ziele, nach denen ich strebte, waren in der Richtung meiner fortwachsenden Studien und Taetigkeit. Es ist deshalb kein Wunder, dass ich schon vor Ende des Jahres 1899 die unternommene Aufgabe beendete und die Resultate erreichte, welche ich in meinem Artkel in Century Magazine vom Juni, 1900, in dem jedes Wort sorgfaeltig gewogen wurde, anzeigte.

Es ist schon viel getan, um mein System kommerziellem Gebrauch zur Verfuegung zu stellen, sowol zur Uebertragung von Energie in kleinen Quantitaeten fuer spezifische Zwecke, als auch auf industriellem Maassstabe. Die von mir erzielten Resultate haben meinen Plan der Intelligenzuebermittlung; fuer welche der Name "Welttelegraphie" vorgeschlagen worden ist, leicht ausfuehrbar gemacht. Das Prinzip ihrer Wirkung, die angewandten Mittel und ihre Anwendungsfahigkeiten bilden, glaube ich, eine radikale und fruchtbare Abweichung von dem, was vorher getan worden ist. Ich habe keinen Zweifel, dass sie sich fuer die Aufklaerung der Massen, besonders in noch uncivilisierten Laendern und schwer zugaenglichen Regionen, sehr wirksam erweisen, und dass sie zur allgemeinen Sicherheit, Bequemlichkeit und Wolsein, und der Aufrechterhaltung friedlicher Verhaeltnisse wesentlich beitragen wird. Sie bedingt die Anwendung einer Anzahl von Anlagen, welche alle instande sind,

individualisierte Signale nach den äussersten Grenzen der Erde zu senden. Jede derselben wird vorzugsweise in der Nähe eines wichtigen Civilisationspunktes gelegen sein, und die Nachrichten, welche sie durch beliebige Mittel und Wege empfängt, werden nach allen Punkten der Erde geblitzt. Eine billige und einfache Vorrichtung, die man in der Tasche tragen könnte, kann dann irgendwo auf See oder Land aufgestellt werden, und wird die Neuigkeiten der Welt, oder solche spezielle Depeschen, die fuer sie bestimmt sind, verzeichnen. Auf diese Weise wird die ganze Erde so zu sagen in ein riesiges Gehirn verwandelt werden, welches imstande ist, in jedem Teile die Mitteilungen aufzunehmen. Da eine einzige Anlage von nur hundert Pferdestärken hunderte Millionen von Instrumenten betätigen kann, wird das System ein tatsächlich unbegrenztes Arbeitsvermögen haben, und muss notwendigerweise die Uebermittlung von Intelligenz ungeheuer erleichtern und billiger machen.

Die erste dieser Centralanlagen wäre schon beendet, wenn sich nicht unvorhergesehene Verzögerungen eingestellt hätten, die jedoch glücklicherweise nichts mit dem rein technischen Charakter zu tun haben. Aber dieser Zeitverlust, obgleich verdriesslich, dürfte sich schliesslich doch als ein Segen in Verkleidung erweisen. Die beste mir bekannte Konstruktion ist gewählt worden, und der Sender wird einen Wellenkomplex von einer gesamten maximalen Aktivität von zehn Millionen Pferdestärken, von welcher ein Prozent reichlich genug ist, "die Erdkugel zu umgerten", von sich geben. Der Effekt dieser ungeheuren Energieabgabe, fast zweimal so

viel als die gesamten Niagarafälle, kann nur durch Anwendung gewisser Kunstgriffe, die ich seiner Zeit bekannt machen werde, erzielt werden.

~~Der~~ Einen grossen Teil der Arbeit, die ich bis jetzt getan habe, habe ich der edlen Grossmutter Herrn J. Pierpont Morgan's zu verdanken, die um so willkommener und ermutigender war, weil sie zu einer Zeit gewahrt wurde als diejenigen, die seitdem am meisten versprochen haben, die grössten Zweifler waren. Auch meinen Freund Stanford White muss ich fuer viele uneigennuetzige und wertvolle Hilfe danken. Diese Arbeit ist nun weit vorgeschritten, und wenn auch die Resultate verspätet sind, werden sie doch sicher kommen.

Die Uebertragung von Energie auf industriellem Maassstabe wird mittlerweile nicht vernachlaessigt. Die Canadian Niagara Power Company hat mir ein vorzuegliches Angebot gemacht, und eine fast eben so grosse Genugthuung als das Erringen von Erfolg der Kunst halber wird es mir verschaffen, ihre Konzession fuer sie finanziell vorteilhaft zu machen. In dieser ersten Kraftanlage, mit deren Entwurf ich seit langer Zeit beschaeftigt bin, beabsichtige ich, zehn tausend Pferdekraefte unter einer Spannung von hundert Millionen Volt, die ich jetzt mit Sicherheit erzeugen und ^{zu} haben kann, zu verteilen.

Diese Energie wird ueberall auf der Erde gesammelt werden, vorzugsweise in kleinen Quantitaeten, von einem Bruchteil einer bis

OCT., 1919,

mehreren Pferdestärken. Einer ihrer Hauptanwendungen wird die Beleuchtung vereinzelt gelegener Heimstätten sein. Es ~~bedarf~~ ^{bedarf} sehr wenig Kraft, eine Wohnung mit Vakuumrohren, die von Hochfrequenzströmen erregt werden, zu erleuchten, und in jedem Falle wird ein ein wenig ueber dem Dach erhobener Pol hinreichen. Noch ein wertvoller Gebrauch wird das Antreiben von Uhren und dergleichen Apparate sein. Diese Uhren werden ausserordentlich einfach sein, werden absolut keiner Wartung beduerfen und werden genau die richtige Zeit angeben. Die Idee der Erde amerikanische Zeit aufzupraegen ist bezaubernd und wird sehr wahrscheinlich populaer werden. Es giebt unzählbare Vorrichtungen aller Arten, die entweder jetzt im Gebrauch sind oder geliefert werden koennen, und inden ich sie auf diese Weise in Betrieb setze, duerfte ich instande sein, mit einer Anlage von nicht mehr als zehn tausend Pferdestaerken der ganzen Welt eine grosse Kommoditaet zu bieten. Die Einfuehrung dieses Systems wird Gelegenheiten gewahren fuer Erfindung und Fabrikation, wie sie sich noch nie vorher dargeboten haben.

Da ich der weitreichenden Wichtigkeit dieses ersten Versuchs und dessen Einfluss^{es} auf zukuenftige Entwicklung gewaertig bin, werde ich langsam und sorgfaeltig zu Werke gehen. Erfahrung hat mich gelehrt fuer Unternehmungen, die nicht gaenzlich von meinen eigenen Faehigkeiten und Anstrengungen abhaengen, einen Termin festzusetzen. Aber ich bin voller Hoffnung, dass diese grossen Verwirklichungen nicht weit entfernt sind, und ich weiss dass, wenn dieses erste Werk vollendet ist, sie mit mathematischer Gewissheit folgen werden.

Wenn die grosse, zufaellig enthuelte und experimentell bestaetigte Wahrheit voellig erkannt wird, dass dieser Planet, bei all seiner erschreckenden Unermesslichkeit, fuer elektrische Stroeme tatsaechlich nichts mehr ist als eine kleine Metallkugel und dass ~~infolge~~ dieser Tatsache die Verwirklichung vieler Moeglichkeiten, von denen jede der Einbildungskraft spottet und von unberechenbarer Bedeutung ist, absolut sicher macht; wenn die erste Anlage in Betrieb gesetzt und bewiesen wird, dass eine telegraphische Botschaft, fast so geheim und unstoerbar wie ein Gedanke, auf irgend eine irdische Entfernung uebertragen werden, dass der Schall der menschlichen Stimme, mit allen ihren Intonationen und Modulationen, getreu und augenblicklich an irgend einer andern Stelle der Erde wieder erzeugt werden, dass die Energie eines Wasserfalles zur Lieferung von Licht, Waerme und Triebkraft, irgendwo - auf See, oder Land oder hoch oben in der Luft - verwendbar gemacht werden kann, dann wird die Menschheit sein wie ein Ameisenhaufe, den man mit einem Stock aufgeruehrt hat: Sehet die Aufregung die da kommt!

by Nikola Tesla.

VI. The Art of Telautomatics.

How Tesla's Mind Recuperates.

No subject to which I have ever devoted myself has called for such concentration of mind and strained to so dangerous a degree the finest fibers of my brain as the system of which the Magnifying Transmitter is the foundation. I put all the intensity and vigor of youth in the development of the rotating field discoveries, but those early labors were of a different character. Although strenuous in the extreme, they did not involve that keen and exhausting discernment which had to be exercised in attacking the many puzzling problems of the wireless. Despite my rare physical endurance at that period the abused nerves finally rebelled and I suffered a complete collapse, just as the consummation of the long and difficult task was almost in sight. Without doubt I would have paid a greater penalty later, and very likely my career would have been prematurely terminated, had not providence equipped me with a safety device, which has seemed to improve with advancing years and unfailingly comes into play when my forces are at an end. So long as it operates I am safe from danger, due to overwork, which threatens other inventors and, incidentally, I need no vacations

which are indispensable to most people. When I am all but used up I simply do as the darkies, who "naturally fall asleep while white folks worry". To venture a theory out of my sphere - the body probably accumulates little by little a definite quantity of some toxic agent and I sink into a nearly lethargic state which lasts half an hour to the minute. Upon awakening I have the sensation as though the events immediately preceding had occurred very long ago, and if I attempt to continue the interrupted train of thought I feel a veritable mental nausea. Involuntarily I then turn to other work and am surprised at the freshness of the mind and ease with which I overcome obstacles that had baffled me before. After weeks or months my passion for the temporarily abandoned invention returns and I invariably find answers to all the vexing questions with scarcely any effort.

In this connection I will tell of an extraordinary experience which may be of interest to students of psychology. I had produced a striking phenomenon with my grounded transmitter and was endeavoring to ascertain its true significance in relation to the currents propagated through the earth. It seemed a hopeless undertaking and for more than a year I worked unremittingly but in vain. This profound study so entirely absorbed me that I became forgetful of everything else, even of my undermined health. At last, as I was at the point of breaking down, nature applied the preservative inducing lethal sleep. Regaining my senses, I realized with consternation that I was

unable to visualize scenes from my life except those of infancy, the very first ones that had entered my consciousness. Curiously enough, these appeared before my vision with startling distinctness and afforded me welcome relief. Night after night, when retiring, I would think of them and more and more of my previous existence was revealed. The image of my mother was always the principal figure in the spectacle that slowly unfolded, and a consuming desire to see her again gradually took possession of me. This feeling grew so strong that I resolved to drop all work and satisfy my longing. But I found it too hard to break away from the laboratory and several months elapsed during which I had succeeded in reviving all the impressions of my past life up to the spring of 1892. In the next picture that came out of the mist of oblivion, I saw myself at the Hotel de la Paix in Paris just coming to from one of my peculiar sleeping spells, which had been caused by prolonged exertion of the brain. Imagine the pain and distress I felt when it flashed upon my mind that a dispatch was handed to me at that very moment bearing the sad news that my mother was dying; I remembered how I made the long journey home without an hour of rest and how she passed away after weeks of agony! It was especially remarkable that during all this period of partially obliterated memory I was fully alive to everything touching on the subject of my research. I could recall the smallest details and the least insignificant observations in my experiments and even recite pages of text and complex mathematical formulae.

My belief is firm in a law of compensation. The true rewards are ever in proportion to the labor and sacrifices made. This is one of the reasons why I feel certain that of all my inventions, the Magnifying Transmitter will prove most important and valuable to future generations. I am prompted to this prediction not so much by thoughts of the commercial and industrial revolution which it will surely bring about, but of the humanitarian consequences of the many achievements it makes possible. Considerations of mere utility weigh little in the balance against the higher benefits of civilization. We are confronted with portentous problems which can not be solved just by providing for our material existence, however abundantly. On the contrary, progress in this direction is fraught with hazards and perils not less menacing than those born from want and suffering. If we were to release the energy of atoms or discover some other way of developing cheap and unlimited power at any point of the globe this accomplishment, instead of being a blessing, might bring disaster to mankind in giving rise to dissension and anarchy which would ultimately result in the enthronement of the hated regime of force. The greatest good will come from technical improvements tending to unification and harmony, and my wireless transmitter is preëminently such. By its means the human voice and likeness will be reproduced everywhere and factories

driven thousands of miles from waterfalls furnishing the power; aerial machines will be propelled around the earth without a stop and the sun's energy controlled to create lakes and rivers for motive purposes and transformation of arid deserts into fertile land. Its introduction for telegraphic, telephonic and similar uses will automatically cut out the statics and all other interferences which at present impose narrow limits to the application of the wireless. This is a timely topic on which a few words might not be amiss.

Tesla Raps "Static" Men Vigorously.

During the past decade a number of people have arrogantly claimed that they had succeeded in doing away with this impediment. I have carefully examined all of the arrangements described and tested most of them long before they were publicly disclosed, but the finding was uniformly negative. A recent official statement from the U. S. Navy may, perhaps, have taught some beguillable news editors how to appraise these announcements at their real worth. As a rule the attempts are based on theories so fallacious that whenever they come to my notice I can not help thinking in a lighter vein. Quite recently a new discovery was heralded, with a deafening flourish of trumpets, but it proved another case of a mountain bringing forth a mouse. This reminds me of an exciting incident which took place years ago when I was conducting my experiments with currents of high frequency. Steve Brodie had just jumped off the Brooklyn Bridge. The feat has been vulgarized since by imitators, but the

first report electrified New York. I was very impressionable then and frequently spoke of the daring printer. On a hot afternoon I felt the necessity of refreshing myself and stepped into one of the popular thirty thousand institutions of this great City where a delicious twelve per cent beverage was served which can now be had only by making a trip to the poor and devastated countries of Europe. The attendance was large and not over-distinguished and a matter was discussed which gave me an admirable opening for the careless remark: "This is what I said when I jumped off the bridge". No sooner had I uttered these words than I felt like the companion of Timotheus in the poem of Schiller. In an instant there was a pandemonium and a dozen voices cried: "It is Brodie!" I threw a quarter on the counter and bolted for the door but the crowd was at my heels with yells: "Stop, Steve!" which must have been misunderstood for many persons tried to hold me up as I ran frantically for my haven of refuge. By darting around corners I fortunately managed - through the medium of the fire-escape - to reach the laboratory, which I threw off my coat, camouflaged myself as a hard working blacksmith, and started the forge. But these precautions proved unnecessary; I had eluded my pursuers. For many years afterward, at night, when imagination turns into spectres the trifling troubles of the day, I often thought, as I tossed on the bed, what my fate would have been had that mob caught me and found out that I was not Steve Brodie!

Now the engineer, who lately gave an account before a technical body of a novel remedy against statics based on a "heretofore unknown law of nature", seems to have been as reckless as myself when he contended that these disturbances propagate up and down, while those of a transmitter proceed along the earth. It would mean that a condenser, as this globe, with its gaseous envelop, could be charged and discharged in a manner quite contrary to the fundamental teachings propounded in every elemental text-book of physics. Such a supposition would have been condemned as erroneous, even in Franklin's time, for the facts bearing on this were then well-known and the identity between atmospheric electricity and that developed by machines was fully established. Obviously, natural and artificial disturbances propagate through the earth and the air in exactly the same way, and both set up electro-motive forces in the horizontal, as well as vertical, sense. Interference can not be overcome by any such methods as were proposed. The truth is this: In the air the potential increases at the rate of about fifty volts per foot of elevation, owing to which there may be a difference of pressure amounting to twenty, or even forty thousand volts between the upper and lower ends of the antenna. The masses of the charged atmosphere are constantly in motion and give up electricity to the conductor, not continuously but rather disruptively, this producing a grinding noise in a sensitive telephonic

receiver. The higher the terminal and the greater the space encompassed by the wires, the more pronounced is the effect, but it must be understood that it is purely local and has little to do with the real trouble. In 1900, while perfecting my wireless system, one form of apparatus comprised four antennae. These were carefully calibrated to the same frequency and connected in multiple with the object of magnifying the action, in receiving from any direction. When I desired to ascertain the origin of the transmitted impulses, each diagonally situated pair was put in series with a primary coil energizing the detector circuit. In the former case the sound was loud in the telephone; in the latter it ceased, as expected, the two antennae neutralizing each other, but the true statics manifested themselves in both instances and I had to devise special preventives embodying different principles.

The Remedy For Statics.

By employing receivers connected to two points of the ground, as suggested by me long ago, this trouble caused by the charged air, which is very serious in the structures as now built, is nullified and besides, the liability of all kinds of interference is reduced to about one-half, because of the directional character of the circuit. This was perfectly self-evident, but came as a revelation to some simple-minded wireless folks whose experience was confined to forms of apparatus that could have been improved with an axe, and they have been disposing of the bear's skin before

killing him. If it were true that strays performed such antics, it would be easy to get rid of them by receiving without aerials. But, as a matter of fact, a wire buried in the ground which, conforming to this view, should be absolutely immune, is more susceptible to certain extraneous impulses than one placed vertically in the air. To state it fairly, a slight progress has been made, but not by virtue of any particular method or device. It was achieved simply by discarding the enormous structures, which are bad enough for transmission but wholly unsuitable for reception, and adopting a more appropriate type of receiver. As I pointed out in a previous article, to dispose of this difficulty for good, a radical change must be made in the system, and the sooner this is done the better.

Radio Government Control Not Wanted.

It would be calamitous, indeed, if at this time when the art is in its infancy and the vast majority, not excepting even experts, have no conception of its ultimate possibilities, a measure would be rushed through the legislature making it a Government monopoly. This was proposed a few weeks ago by Secretary Daniels, and no doubt that distinguished official has made his appeal to the Senate and House of Representatives with sincere conviction. But universal evidence unmistakably shows that the best results are always obtained in healthful commercial competition. There are, however, exceptional reasons why ^{wireless} A should be given the fullest freedom of

development. In the first place it offers prospects immeasurably greater and more vital to betterment of human life than any other invention or discovery in the history of man. Then again, it must be understood that this wonderful art has been, in its entirety, evolved here and can be called "American" with more right and propriety than the telephone, the incandescent lamp or the aeroplane. Enterprising press agents and stock jobbers have been so successful in spreading misinformation that even so excellent a periodical as the Scientific American accords the chief credit to a foreign country. The Germans, of course, gave us the Hertz-waves and the Russian, English, French and Italian experts were quick in using them for signalling purposes. It was an obvious application of the new agent and accomplished with the old classical and unimproved induction coil-scarcely anything more than another kind of heliography. The radius of transmission was very limited, the results attained of little value, and the Hertz oscillations, as a means for conveying intelligence, could have been advantageously replaced by sound-waves, which I advocated in 1891. Moreover, all these attempts were made three years after the basic principles of the wireless system, which is universally employed today, and its potent instrumentalities had been clearly described and developed in America. No trace of those Hertzian appliances and methods remains today. We have proceeded in the very opposite direction and what has been done is the product of the brains and efforts of citizens of this country. The fundamental patents have expired and the opportunities are open to all. The chief argument of the Secretary is based on interference. According to his statement reported in the New York Herald of July 29th, signals from a powerful station can be intercepted in every village of the world. In view of this fact, which was demonstrated in my experiments of 1900, it would be of little

America First.

use to impose restrictions in the United States. PAs throwing light on this point, I may mention that only recently an odd looking gentleman called on me with the object of enlisting my services in the construction of world transmitters in some distant land. "We have no money," he said, "but carloads of solid gold and we will give you a liberal amount." I told him that I wanted to see first what will be done with my inventions in America and this ended the interview. But I am satisfied that some dark forces are at work, and as time goes on the maintenance of continuous communication will be rendered more difficult. The only remedy is a system immune against interruption. It has been perfected, it exists, and all that is necessary is to put it in operation.

The terrible conflict is still uppermost in the minds and perhaps the greatest importance will be attached to the Magnifying Transmitter as a machine for attack and defense, more particularly in connection with telautomatics. This invention is a logical outcome of observations begun in my boyhood and continued throughout my life. When the first results were published, the Electrical Review stated editorially that it would become one of the "most potent factors in the advance and civilization of mankind". The time is not distant when this prediction will be fulfilled. In 1898 and 1900 it was offered to the Government and might have been adopted were I

one of those who would go to Alexander's shepherd when they want something from Alexander. At that time I really thought that it would abolish war, because of its unlimited destructiveness and elimination of the personal element of combat. But while I have not lost faith in its potentialities, my views have changed since.

The Road To Permanent Peace.

War can not be avoided until the physical cause for its recurrence is removed and this, in the last analysis, is the vast extent of the planet on which we live. Only through annihilation of distance in every respect as, the conveyance of intelligence, transport of passengers and supplies and transmission of energy will conditions be brought about some day, insuring permanency of friendly relations. What we now want most is closer contact and better understanding between individuals and communities all over the earth, and the elimination of that fanatic devotion to exalted ideals of national egoism and pride which is always prone to plunge the world into primeval barbarism and strife. No League or parliamentary act of any kind will ever prevent such a calamity. These are only new devices for putting the weak at the mercy of the strong. I have expressed myself in this regard fourteen years ago when a combination of few leading governments - a sort of Holy Alliance - was advocated by the late Andrew Carnegie, who may be fairly considered as

the father of this idea, having given to it more publicity and
than anybody else
impetus prior to the efforts of the President. While it can
not be denied that such a pact might be of material advantage
to some less fortunate peoples, it can not attain the chief
object sought. Peace can only come as a natural consequence
of universal enlightenment and merging of races, and we are
still far from this blissful realization. As I view the
world of today, in the light of the gigantic struggle we have
witnessed, I am filled with conviction that the interests of
humanity would be best served if the United States remained
true to its traditions and kept out of "entangling alliances".
Situating as it is, geographically, remote from the theaters
of impending conflicts, without incentive to territorial
aggrandizement, with inexhaustible resources, and immense
population thoroughly imbued with the spirit of liberty and
right, this country is placed in a unique and privileged
position. It is thus able to exert, independently, its col-
ossal strength and moral force to the benefit of all, more
judiciously and effectively, than as member of a league.

In one of these biographical sketches, published in the Electrical Experimenter, I have dwelt on the circumstances of my early life and told of an affliction which compelled me to unremitting exercise of imagination and self-observation. This mental activity, at first involuntary under the pressure of illness and suffering, gradually became second nature and led me finally to recognize that I was but an automaton devoid of free will in thought and action and merely responsive to the forces of the environment. Our bodies are of such complexity of structure, the motions we perform are so numerous and involved, and the external impressions on our sense organs to such a degree delicate and elusive that it is hard for the average person to grasp this fact. And yet nothing is more convincing to the trained investigator than the mechanistic theory of life which had been, in a measure, understood and propounded by Descartes three hundred years ago. But in his time many important functions of our organism were unknown and, especially with respect to the nature of light and the construction and operation of the eye, philosophers were in the dark. In recent years the progress of scientific research in these fields has been such as to leave no room for a doubt in regard to this view on which many works have been published. One of its ablest and most eloquent exponents is, perhaps, Felix Le Dantec, formerly assistant of Pasteur. Prof. Jacques Loeb has performed remarkable experiments in heliotropism, clearly establishing the controlling power of light in

lower forms of organisms and his latest book "Forced Movements" is revelatory. But while men of science accept this theory simply as any other that is recognized, to me it is a truth which I hourly demonstrate by every act and thought of mine. The consciousness of the external impression prompting me to any kind of exertion, physical or mental, is ever present in my mind.

Only on very rare occasions, when I was in a state of exceptional concentration, have I found difficulty in locating the original

Lack of impulses. ^{Par.} The by far greater ^{number} of human beings are never aware of Observation what is passing around and within them, and millions fall victims of A Form of disease Ignorance. and die prematurely just on this account. The commonest, every-

day occurrences appear to them mysterious and inexplicable. One may feel a sudden wave of sadness and rake his brain for an explanation when he might have noticed that it was caused by a cloud cutting off the rays of the sun. He may see the image of a friend dear to him under conditions which he construes as very peculiar, when only shortly before he has passed him in the street or seen his photograph somewhere. When he loses a collar button he fusses and swears for an hour, being unable to visualize his previous actions and locate the object directly. Deficient observation is merely a form of ignorance and responsible for the many morbid notions and foolish ideas prevailing. There is not more than one out of every ten persons who does not believe in telepathy and other psychic manifestations, spiritualism and communion with the dead and who would refuse to listen to

willing or unwilling deceivers. Just to illustrate how deeply rooted this tendency has become even among the clear-headed Psychic Phenomena in the Manufacture of Elevators. American population, I may mention a comical incident. ^{Not} Shortly before the war, when the exhibition of my turbines in this City elicited widespread comment in the technical papers, I anticipated that there would be a ^{scramble} ~~xxx~~ among manufacturers to get hold of the invention and I had particular designs on that man from Detroit who has an uncanny faculty for accumulating millions. So ^{confident} ~~sure~~ was I that he would turn up some day, ~~at my office~~ that I declared this as certain to my secretary and assistants. Sure enough, one fine morning a body of engineers, ^{from} ~~representing~~ the Ford Motor Company presented themselves with the request of discussing with me an important project. "Didn't I tell you?" I remarked triumphantly to my employes, and one of them said, "You are wonderfully Mr. Tesla, everything comes out exactly as you predict." As soon as these ^{hard-headed} ~~distinguished~~ men were seated I, of course, immediately began to extol the wonderful features of my turbine when the spokesman interrupted me and said, "We know all about this but we are on a special errand. We ^{have} formed a psychological society for the investigation of psychic phenomena and we want you to join us in this undertaking." I suppose these engineers never knew how near they came to being fired out of my office.

COMPUTING SPIRITISM.

Ever since I was told by some of the greatest men of the time, leaders in science whose names are immortal, that I am possessed of an unusual mind, I bent all my thinking faculties on the solution of great problems regardless of sacrifice.

For many years I endeavored to solve the enigma of death and watched eagerly for every kind of spiritual indication. But only once in the course of my existence have I had an experience which, momentarily, impressed me as supernatural. It was at the time of my mother's death. I had become completely exhausted by pain and long vigilance and one night was carried to a building about two blocks from our home. As I lay helpless there, I thought that if my mother died while I was away from her bedside she would surely give me a sign. Two or three months before I was in London in company with my late friend, Sir William Crookes, when spiritualism was discussed and I was under the full sway of these thoughts. I might not have paid attention to other men but was susceptible to his arguments as it was his epochal work on radiant matter, which I had read as a student, that made me embrace the electrical career. I reflected that the conditions for a look into the beyond were most favorable, for my mother was a woman of genius and particularly excelling in the powers of intuition. During the whole night every fiber in my brain was strained in expectancy, but nothing happened, ^{until} ~~and~~ early in the ^{when} morning, I fell in a sleep or perhaps a swoon, and saw a cloud carrying angelic figures of marvelous beauty, one of whom gazed upon me lovingly and gradually assumed the features of my mother. The appearance slowly floated across the room and vanished and I was awakened by an indescribably sweet song of many voices. In that instant a certitude, which no words can express, came upon me that my mother had ^{just} died, and that was true. I ~~have never since~~

was
unable to understand the tremendous weight of the painful knowledge I received in advance and wrote a letter to Sir William Crookes while still under the domination of these impressions and in poor bodily health. When I recovered I sought for a long time the external cause of this strange manifestation and, to my great relief, I succeeded after many months of fruitless effort. I had seen the painting of a celebrated artist, representing allegorically one of the seasons in the form of a cloud with a group of angels which seemed to actually float in the air, and this had struck me forcefully. It was exactly the same that appeared in my dream with the exception of my mother's likeness. The music came from the choir in the church^{nearby} at the early mass of Easter morning, explaining everything satisfactorily in conformity with scientific facts.

This occurred long ago and I have never had the faintest reason since to change my views on psychical and spiritual phenomena for which there is absolutely no foundation. The belief in these is the natural outgrowth of intellectual development. Religious dogmas are no longer accepted in their orthodox meaning but every individual clings to some faith in a Supreme power of some kind. We^{all} must have^{an} ideal to govern our conduct and insure contentment but it is immaterial whether it be one of creed, art, science or anything else, so long as it fulfills the function of a dematerializing force. It is essential to the peaceful existence of humanity as a whole that one common conception should prevail.

Tesla's Anticipating Discovery.

While I have failed to obtain any evidence in support

of the contentions of psychologists and spiritualists, I have proved to my complete satisfaction the automatism of life, not only through continuous observations of individual actions, but even more conclusively, through certain generalizations. These amount to a discovery which I consider of the greatest moment to human society and on which I shall briefly dwell. I got the first inkling of this astounding truth when I was still a very young man, but for many years I interpreted what I noted simply as coincidences. Namely, whenever either myself or a person to whom I was attached, or a cause to which I was devoted, was hurt by others in a particular way, which might be best popularly characterized as the most unfair imaginable, I experienced a singular and undefinable pain which, for want of a better term, I have qualified as "cosmic", and shortly thereafter, and invariably, those who had inflicted it came to grief. After many such cases I confided this to ^{a number of friends,} ~~others~~ who had the opportunity to convince themselves of the truth of the theory which I ^{have} ~~am~~ gradually formulated and which may be stated in the following few words.

Our bodies are of similar construction and exposed to the same external influences. This results in likeness of response and concordance of the general activities on which all our social and other rules and laws are based. We are automata entirely controlled by the forces of the medium, being tossed about like corks on the surface of the water, but mistaking the resultant of the impulses from the outside for free will. The movements and other actions we perform are always life-preservative

and though seemingly quite independent from one another, we are connected by invisible links. So long as the organism is in perfect order it responds accurately to the agents that prompt it, but the moment that there is some derangement in any individual, his self-preservative power is impaired.

Everybody understands, of course, that if one becomes deaf, has his eyesight weakened, or his limbs injured, the chances for his continued existence are lessened. But this is also true, and perhaps moreso, of certain defects in the brain which deprive the automaton, more or less, of that vital quality and cause it to rush into destruction. A very sensitive and observant being, with his highly developed mechanism all intact, and acting with precision in obedience to the changing conditions of the environment, is endowed with a transcending mechanical sense, enabling him to evade perils too subtle to be directly perceived. When he comes in contact with others whose controlling organs are radically faulty, that sense asserts itself and he feels the 'cosmic' pain. The truth of this has been borne out in hundreds of instances and I am inviting other students of nature to devote attention to this subject, believing that through combined and systematic effort results of incalculable value to the world will be attained.

Dr. Tesla's First Telautomaton.

The idea of constructing an automaton, to bear out my theory, presented itself to me early but I did not begin active work until 1893, when I started my wireless investigations. During the succeeding two or three years a number of automatic mechanisms,

to be from a
A actuated, at distance, were constructed by me and exhibited to
visitors in my laboratory. In 1896, however, I designed a complete
machine capable of a multitude of operations, but the consummation
of my labors was delayed until late in 1897. This machine was
illustrated and described in my article in the Century Magazine
of June, 1900, and other periodicals of that time and, when first
shown in the beginning of 1898, it created a sensation such as
no other invention of mine has ever produced. In November, 1898,
a basic patent on the novel art was granted to me, but only after
the Examiner-in-Chief had come to New York and witnessed the per-
formance, for what I claimed seemed unbelievable. I remember that
when later I called on an official in Washington, with a view of
offering the invention to the Government, he burst out in laughter
upon my telling him what I had accomplished. Nobody thought then
that there was the faintest prospect of perfecting such a device.
It is unfortunate that in this patent, following the advice of my
attorneys, I indicated the control as being effected through the
medium of a single circuit and a well-known form of detector, for
the reason that I had not yet secured protection on my methods and
apparatus for individualization. As a matter of fact, my boats
were controlled through the joint action of several circuits and
interference of every kind was excluded. Most generally I employed
receiving circuits in the form of loops, including condensers,
because the discharges of my high tension transmitter ionized the
air in the hall so that even a very small aerial would draw elec-
tricity from the surrounding atmosphere for hours. Just to give
an idea, I found, for instance, that a bulb 12" in diameter, highly

exhausted, and with one single terminal to which a short wire was attached, would deliver well on to one thousand successive flashes before all charge of the air in the laboratory was neutralized. The loop form of receiver was not sensitive to such a disturbance and it is curious to note that it is becoming popular at this late date. In reality it collects much less energy than the aeriads or a long grounded wire, but it so happens that it does away with a number of defects inherent to the present wireless devices. In demonstrating my invention before audiences, the visitors were requested to ask any questions, however involved, and the automaton would answer them by signs. This was considered magic at that time but was extremely simple, for it was myself who gave the replies by means of the device.

At the same period another larger telautomatic boat was constructed, a photograph of which is shown in this number of the Electrical Experimenter. It was controlled by loops having several turns placed in the hull, which was made entirely water-tight and capable of submergence. The apparatus was similar to that used in the first with the exception of certain special features I introduced as, for example, incandescent lamps which afforded a visible evidence of the proper functioning of the machine and served for other purposes.

TELAUTOMATICS of the FUTURE.

These automata, controlled within the range of vision of the operator, were, however, the first and rather crude steps in the evolution of the Art of Telautomatics as I had conceived it. The next logical improvement was its application to automatic mechanisms beyond the limits of vision and at great distance from the

center of control, and I have ever since advocated their employment as instruments of warfare in preference to guns. The importance of this now seems to be recognized, if I am to judge from casual announcements through the press of achievements which are said to be extraordinary but contain no merit of novelty whatever. In an imperfect manner it is practicable, with the existing wireless plants, to launch an aeroplane, have it follow a certain approximate course, and perform some operation at a distance of many hundreds of miles. A machine of this kind can also be mechanically controlled in several ways and I have no doubt that it may prove of some usefulness in war. But there are, to my best knowledge, no instrumentalities in existence today with which such an object could be accomplished in a precise manner. I have devoted years of study to this matter and have evolved means, making such and greater wonders easily realizable. As stated on a previous occasion, when I was a student at college I conceived a flying machine quite unlike the present ones. The underlying principle was sound but could not be carried into practice for want of a prime-mover of sufficiently great activity. In recent years I have successfully solved this problem and am now planning aerial machines devoid of sustaining planes, ailerons, propellers and other external attachments, which will be capable of immense speeds and are very likely to furnish powerful arguments for peace in the near future. Such a machine, sustained and propelled entirely by reaction, is shown on one of the pages and is supposed to be controlled either

mechanically or by wireless energy. By installing proper plants it will be practicable to project a missile of this kind into the air and drop it almost on the very spot designated which may be thousands of miles away. But we are not going to stop at this. Telautomata will be ultimately produced, capable of acting as if possessed of their own intelligence and their advent will create a revolution. As early as 1898 I proposed to representatives of a large manufacturing concern the construction and public exhibition of an automobile carriage which, left to itself, would perform a great variety of operations involving something akin to judgment. But my proposal was deemed chimerical at that time and nothing came from it.

At present many of the ablest minds are trying to devise expedients for preventing a repetition of the awful conflict which is only theoretically ended and the duration and main issues of which I have ^{correctly} predicted in an article printed in the Sun of December 20, 1914. The proposed League is not a remedy but, on the contrary, in the opinion of a number of competent men, may bring about results just the opposite. It is particularly regrettable that a punitive policy was adopted in framing the terms of peace, ^{because} ~~xxx~~ a few years hence it will be possible for nations to fight without armies, ships or guns, by weapons far more terrible, to the destructive action and range of which there is virtually no limit. Any city, at a distance whatsoever, from the enemy, can be destroyed by him and no power on earth can stop him from doing so. If we want to avert an

impending calamity and a state of things which may transform this globe into an inferno, we should push the development of flying machines and wireless transmission of energy without an instant's delay and with all the power and resources of the nation.

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of the

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ARTICLE I.

MEETING OF STOCKHOLDERS.

Sec. 1: The annual meeting of the stockholders of this Company shall be held at the office of the Corporation on the third Thursday in January of each and every year at 4 P.M. for the election of directors and such other business as may properly come before the meeting. Notice of the time, place and object of such meeting shall be given by publication thereof at least once in each week for two successive weeks immediately preceeding such meeting in the manner required by the Stock Corporation Law and by mailing at least six days previous to such meeting, postage prepaid, a copy of such notice, addressed to each stockholder at his P.O. address as same shall appear on the books of the Company. No business other than that stated in such notice shall be transacted at such meeting without the unanimous consent of all stockholders present thereat in person or by proxy.

Sec. 2: Special meetings of the stockholders other than those regulated by statute may be called at any time by a major-

BY-LAWS

of the

TESLA MACHINE COMPANY.

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ARTICLE I.

MEETING OF STOCKHOLDERS.

Sec. 1: The annual meeting of the stockholders of this Company shall be held at the office of the Corporation on the third Thursday in January of each and every year at 4 P.M. for the election of directors and such other business as may properly come before the meeting. Notice of the time, place and object of such meeting shall be given by publication thereof at least once in each week for two successive weeks immediately preceeding such meeting in the manner required by the Stock Corporation Law and by mailing at least six days previous to such meeting, postage prepaid, a copy of such notice, addressed to each stockholder at his P.O. address as same shall appear on the books of the Company. No business other than that stated in such notice shall be transacted at such meeting without the unanimous consent of all stockholders present thereat in person or by proxy.

Sec. 2: Special meetings of the stockholders other than those regulated by statute may be called at any time by a major-

ity of the directors. It shall also be the duty of the President to call such meeting when requested so to do by one director other than himself, and whenever requested in writing so to do by stockholders owning one-third of the capital stock. A notice of every special meeting, stating the time, place and object thereof, shall be given by mailing, postage prepaid, at least six days before such meeting, a copy of such notice addressed to each stockholder at his post office address as the same appears on the books of the Company.

Sec. 3: At all meetings of stockholders, there shall be present either in person or by proxy stockholders owning at least three-fifths of the capital stock of the Corporation in order to constitute a quorum except at special elections of directors pursuant to the General Corporation Law.

Sec. 4: At all annual meetings of stockholders the right of any stockholder to vote shall be governed and determined as prescribed in the General Corporation Law.

Sec. 5: If for any reason the annual meeting of the stockholders shall not be held as hereinbefore provided, such annual meeting shall be called and conducted as prescribed in the General Corporation Law.

Sec. 6: At all meetings of the stockholders only such persons shall be entitled to vote in person and by proxy who appear as stockholders on the transfer books of the Company for ten days immediately preceeding such meeting.

Sec. 7: At the annual meeting of stockholders the follow-

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ing shall be the order of business, viz:

1. Calling the roll.
2. Proof of proper notice of meeting.
3. Report of President.
4. Report of Secretary.
5. Report of Treasurer.
6. Report of Committees.
7. Election of Directors and inspectors of election.
8. Miscellaneous business.

Sec. 8: At all meetings of stockholders all questions, except the question of an amendment to the By-Laws and the election of Directors and inspectors of election, and all such other questions, the manner of deciding which is specially regulated by statute, shall be determined by a majority vote of the stockholders present in person or by proxy; provided, however, that any qualified voter may demand a stock vote and in that case, such stock vote shall be taken immediately, and each stockholder present in person or by proxy shall be entitled to one vote for each share of stock owned by him. All voting shall be 'viva voce', except that a stock vote shall be by ballot, each of which shall state the name of the stockholder voting and the number of shares owned by him, and in addition, if such ballot be cast by a proxy, it shall also state the name of such proxy.

Sec. 9: At special meetings of stockholders the provisions of the General Corporation Law shall apply to the casting of all votes.

ARTICLE II.

DIRECTORS.

Sec. 1: The Directors of this Corporation shall be elected by ballot for the term of one year at the annual meeting of the stockholders, except as hereinafter otherwise provided for

(1) filling vacancies. The directors shall be chosen by a plurality of the votes of the stockholders voting either in person or by proxy.

Sec. 2: Vacancies in the Board of Directors occurring during the year, shall be filled for the unexpired term by a majority vote of the remaining directors at any special meeting called for that purpose or at any regular meeting of the Board.

Sec. 3: In case the entire Board of directors shall die or resign, any stockholder may call a meeting in the same manner that the president may call such meeting, and Directors of the unexpired term may be elected at such special meeting in the manner provided for their election at annual meetings.

Sec. 4: The Board of Directors may adopt such rules for the regulation of their meetings and management of the affairs of the Corporation as they may deem proper, not inconsistent with the Laws of the State of New York or their by-laws.

Sec. 5: The Board of Directors shall meet at such regular times as they may fix and whenever called together by the President upon due notice given to each Director. On the written request of any Director, the Secretary shall call a special meeting of the Board.

Sec. 6: All Committees shall be appointed by the Board of Directors.

ARTICLE III.

OFFICERS.

Sec. 1: The Board of Directors immediately after the annual meeting shall choose one of their number by a majority vote

to be President and in the same manner they shall also elect a Vice President, a Treasurer, and a Secretary, and may also appoint such other officers as they may deem necessary. The elected Officers shall serve for one year or until the next annual election. The appointed Officers shall serve during the pleasure of the Board. The Board of Directors shall fix the salaries, if any, that shall be paid to the several Officers of the Company.

Sec. 2: The President shall preside at all meetings of the Board of Directors and shall act as temporary chairman at and call to order all meetings of the stockholders. He shall sign certificates of stock, sign and execute all contracts in the name of the Company when authorized so to do by the Board of Directors, appoint and discharge agents and employees subject to the approval of the Board of Directors, and he shall have the general management of the affairs of the Corporation and perform all the duties incidental to his office. At the annual meeting he shall present a written report to the stockholders, setting forth in full the condition of the Company. He shall countersign all notes or other evidences of indebtedness authorized by the Board of Directors.

Sec. 3: The Vice President shall in the absence or incapacity of the President perform the duties of that office.

Sec. 4: The Treasurer shall have the care and custody of all the funds and securities of the Corporation and deposit the same in the name of the Corporation in such banks as the Directors may elect. He shall sign certificates of stock and all checks, drafts, notes, and orders for the payment of money,

and he shall pay out the funds of the Company as authorized by the President or Board of Directors. He shall keep and have charge of the books of the Company, and at all reasonable times exhibit his books and accounts to any director or stockholder of the Company upon application at the office of the Company during business hours. He shall affix the seal of the Company to all certificates of stock and all other instruments requiring same when so directed by the Board of Directors.

Sec. 5: The Secretary shall keep the minutes of the Board of Directors and also the minutes of the meeting of the stockholders; he shall attend to the giving and serving of all notices of the Company; he shall have charge of such books and papers as the Board may direct; he shall attend to such correspondence as may be assigned to him; and perform all the duties incidental to his office.

ARTICLE IV.

CAPITAL STOCK.

Sec. 1: Subscriptions to the capital stock must be paid to the Treasurer at such time or times and in such installments as the Board of Directors may by resolution require. Any failure to pay an installment when required to be paid by the Board of Directors shall work a forfeiture of such shares of stock in arrears, pursuant to the Stock Corporation Law.

Sec. 2: Certificates of stock shall be numbered and registered in the order in which they are issued and shall be signed by the President or Vice President and by the Treasurer or Secretary, and the seal of the Corporation shall be affixed

thereto. All certificates shall be bound in a book and shall be issued in consecutive order therefrom and in the margin thereof shall be entered the name of the person owning the shares therein represented, the number of shares and the date thereof. All certificates exchanged or returned to the Corporation shall be marked cancelled with the date of cancellation by the Treasurer and shall be immediately pasted in the certificate book opposite the memorandum of its issue.

Sec. 3: Transfers of stock shall only be made on the books of the Company by the holder in person or by power of attorney duly executed and acknowledged and filed with the Treasurer of the Corporation and on surrender of the certificate or certificates of such shares.

Sec. 4: Whenever the capital stock of the Company is increased, each bona fide owner of its stock shall be entitled to purchase, at the par value thereof, an amount of stock in proportion to the number of shares of stock he owns in the corporation at the time of such increase.

ARTICLE V.

DIVIDENDS.

Sec. 1: Dividends shall be declared and paid out of the surplus profits of the Corporation as often and at such times as the Board of Directors may determine.

ARTICLE VI.

INSPECTORS.

Sec. 1: Two inspectors of election shall be elected at each annual meeting of the stockholders to serve for one year.

and if any inspector shall refuse to serve or shall not be present, the meeting may appoint an inspector in his place.

ARTICLE VII.

SEAL.

Sec. 1: The Seal of the Corporation shall be in the form of a circle and shall bear the name of the Corporation and the year of its incorporation.

ARTICLE VIII.

AMENDMENTS.

Sec. 1: These by-laws may be amended at any stockholders meeting by a vote of the stockholders owning a majority of the stock, represented either in person or by proxy, provided the proposed amendment is inserted in the notice of such meeting; they may also be amended at any meeting of the Board of Directors by a three-fifths vote of the Directors.

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TESLA'S NEW SYSTEM OF FLUID PROPULSION

In subduing the forces of Nature to his service man must invariably avail himself of some process in which a fluid acts as carrier of energy, this being an essential step in any industrial undertaking dependent on mechanical power. Evidently then, a discovery or radical departure in that domain must be of extreme importance and far-reaching influence on the existing conditions and phases of modern life.

Fluid propulsion is now effected by means of pistons, vanes or blades, which entail complexity of construction and impose many limi-

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tations on the propelling as well as propelled mechanism and its performance. Tesla has dispensed with these devices and produced machines of extraordinary simplicity which, moreover, are in many other respects superior to the old types universally employed. A few words will be sufficient to convey a clear idea of his invention.

Every fluid, as water or air, possesses two salient properties: adhesion and viscosity. Owing to the first it is attracted and clings to a metallic surface; by virtue of the second it resists the separation of its own particles. As an inevitable consequence a cer-

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tain amount of fluid is dragged along by a body propelled through it; conversely, if a body be placed in a fluid in motion it is impelled in the direction of movement. The practical forms of Tesla's apparatus consist of flat, circular disks, with central openings, mounted on a shaft and enclosed in a casing provided with ports at the peripheral and central portions. When deriving energy from any kind of fluid it is admitted at the periphery and escapes at the centre; when, on the contrary, the fluid is to be energized, it enters in the centre and is expelled at the periphery. In either case it traverses the in-

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torstices between the disks in a spiral path,
power being derived from, or imparted to it,
by purely molecular action. In this novel man-
ner the heat energy of steam or explosive mix-
tures can be transformed with high economy in-
to mechanical effort; motion transmitted from
one shaft to another without solid connection;
vessels may be propelled with great speed; wat-
er raised or air compressed; an almost perfect
vacuum can be attained, substances frozen and
gases liquefied.

While this improvement has the
breadth and applicability of a fundamental
mechanical concept, the widest field for its

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commercial exploitation is, obviously, the thermo-
dynamic conversion of energy.

The commercial value of a prime-
mover is determined by its efficiency, specific
performance relative to weight and space occupied,
cheapness of manufacture, safety and reliability
of operation, adaptability to construction in
large units, capability of running at high periph-
eral velocity, reversibility, and a number of other
features of lesser importance. In the majority of
these a machine, operating on the new principle,
excels. But there is one quality which is most
desirable in a thermo-dynamic transformer from the

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economic point of view, and that is great resistance to deterioration and impairment of efficiency by heat.

The employment of high temperature is of such vital bearing on the efficiency of prime-movers that it is of paramount importance to extend the thermal range as far as practicable. In the present state of the art radical progress towards more economical transformation of the energy of fuel can only be achieved in that direction. Such being the case, the capability of the machine to withstand deteriorating effects of great heat is the controlling factor in determining its commercial value. In that most desired quality the

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Tesla turbine surpasses all the older types of heat motors. The Diesel and other internal combustion engines are fatally limited in this respect by their complete dependence on closely fitting sliding joints and unfailing supply of clean lubricant; while in the present forms of turbines buckets, blades and inherent mechanical deficiencies impose similar restrictions. These parts are too delicate and perishable to serve as elements of a gas turbine and this has been the main obstacle in the way of its successful realization. The rotor of the Tesla turbine presents a relatively enormous

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active area and the wear is quite insignificant as the fluid, instead of striking against the propelling organs in the usual destructive manner, flows parallel with the same, imparting its momentum by adhesion and viscosity instead of impact. Moreover, it has been shown that the efficiency of this form of rotor is not impaired to any appreciable degree by a roughening of the disks and that it operates satisfactorily even if the working medium is corrosive to an extent.

The universal adoption of steam as motive power under certain standard conditions, settled upon in the course of time, gradually forced upon the minds of engineers the Rankine

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Cycle Efficiency as criterion of performance and long continued endeavors to improve the same have finally resulted in complex multistage constructions entirely unsuitable for high temperatures. The Tesla turbine, by virtue of its exceptional heat-resisting and other unique properties, makes possible the attainment of great fuel economy with but a single stage, incidentally offering the additional advantages of an extremely simple, small, compact, and reliable mechanism. But perhaps the chief commercial value of this new prime-mover will be found in the fact that it can be operated with the cheapest grade of crude oil, colloidal fuel, or powdered coal, containing con-

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siderable quantities of grit, sulphur and other impurities, thus enabling vast sums of money to be saved annually in the production of power from fuel.

The Tesla turbine also lends itself to use in conjunction with other types, especially with the Parsons with which it forms an ideal combination. Although its practical introduction has been delayed by the force of circumstances, a number of years have been spent in exhaustive investigations and experiments on the basis of which the performance in any given case can be closely calculated. The first public tests were made before the

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outbreak of the war at the Waterside Station of the New York Edison Company where several machines, ranging from 100 to 5000 h.p., were installed and operated with satisfactory results. That the invention was appreciated by the technical profession may be seen from the excerpts of statements by experts and periodicals printed on the annexed page.

The salient advantages of the Tesla turbine may be summed up as follows:

EFFICIENCY: The most economical of the present prime-movers is the Diesel engine.

But, quite apart of many practical and com-

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mercial drawbacks, inseparable from this type, it is entirely dependent on comparatively expensive oil, so that the Tesla Gas Turbine, working with much cheaper fuel, would have the better in competition even if its efficiency as a thermodynamic transformer were appreciably lower, all the more so in view of its greater mechanical perfection.

Referring to turbines, all of which are surpassed by the Parsons in economy as well as extent of use, definite limits have already been reached and the only possibilities of saving fuel exist in the employment of steam at very high superheat

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and utilization of gas or oil as motive fuel.

But none of the primemovers mentioned is adapted for such operation and although every effort has been made in this direction, no signal success has been achieved. The superheat is at most 250° F, this being considered the maximum permissible. All attempts to considerably extend the thermal range have failed chiefly because of the inability of bucket structures to withstand the action of intense heat. The Tesla Turbine can operate quite satisfactorily with the motive agent at very high temperature and, owing to this quality,

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lens itself exceedingly well to these purposes.

SPECIFIC PERFORMANCE: In this particular it is

superior to all other forms. Each disk is vir-

tually the equivalent of a whole bucket wheel,

and as many of them take up but a small width

the output of the machine, considering its

weight and size, is surprisingly great. This,

while not being a measure of efficiency, is

nevertheless a feature of considerable import-

ance in many instances.

CHEAPNESS OF MANUFACTURE: The new turbine

can be produced without a single machined part

except the shaft, all the disks being punched

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and the casings pressed. By this method, with proper machinery installed on a large scale, the cost of production may be reduced to a figure never deemed possible in the construction of an engine. What is more, this can be done without material sacrifice of efficiency as small clearances are not essentially required.

SAFETY AND RELIABILITY OF OPERATION: There is an ever present danger in the running of high speed machines. A bucket turbine may at any moment run away and wreck the plant. Such accidents have happened again and again and this

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peril has often proved a deterrent to investment.

A remarkable quality of this turbine is its complete safety. As regards the wear and tear of the propelling organs it is significant and, in any event, of no consequence on the performance.

ADAPTABILITY TO CONSTRUCTION IN LARGE UNITS: In

all the present machines there is a distinct limit to capacity, for although large units can be manufactured, they are very costly and difficult to manage. The new turbine is so simple and the output so large that the limits in this direction can be greatly extended.

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RESISTANCE TO DETRIORATION BY HEAT AND OTHER

AGENTS: In this feature again it has an over-

whelming advantage over the old types in which the maintenance of smooth surfaces and sharp edges is indispensable to efficient working.

In the Tesla Turbine, for the reasons already stated, the destructive actions of heat and corrosive agents are much less pronounced and of relatively negligible effect. This fact has a most important bearing on the saving of fuel.

CAPABILITY OF RUNNING AT HIGH PERIPHERAL SPEED:

In this respect also it is superior to others. The rotating structure carries no load and is

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excellently adapted to withstand tensile stresses. Judging from the most recent turbine practice this quality should be of special value.

REVERSIBILITY: The present turbines are greatly handicapped by their incapability of reversal which is a very serious defect in certain applications, as the propulsion of vessels, necessitating the employment of auxiliary turbines which detracts from the propulsive power and adds materially to the cost of production and maintenance of the equipment. The Tesla Turbine has the unique

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property of being reversible; not only this but it operates with the same efficiency in either direction. For marine purposes it therefore constitutes an ideal motor whether used alone or in conjunction with older types.

Besides the above it possesses other desirable features, constructive and operative, which will add to its value and adaptability to many industrial and commercial uses as, railroading, marine navigation, aerial propulsion, generation of electricity, refrigeration, operation of trucks and automobiles, hydraulic gearing, agriculture, irrigation, mining and similar purposes.

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EXPRESSIONS OF OPINION ON THE TESLA TURBINE

- C. B. Richards, Professor Emeritus of Mechanism, Yale University:
"I am amazed at the development of power given by the turbine and stunned by the exhibit."
- F. Sargent, Chief Engineer and Turbine Expert: "I am impressed with the newness and novelty of the underlying principle of this invention. It is such as will claim the attention and admiration of anyone of a scientific turn of mind in a mechanical direction."
- Reynold Janney, Chief Engineer, Universal Transmission Co: "It is a great invention."
- Brigadier Allen, of the War Department: "Something new in the world. Officers are greatly impressed with it."
- Miller Reese Hutchinson, Chief Engineer: "It is the greatest invention of the age."
- Arnold Trinyi, Chief Engineer, Celsourungs-Gesellschaft, Germany:
"The ideal of the turbine engine."
- B. R. T. Collins (Power Plant Economist): "It is a wonderful turbine."
- The Motor World: "The new principle unquestionably is a great contribution to science and engineering, great in its simplicity and breadth of application."
- Scientific American: "Considered from the mechanical standpoint, the turbine is astonishingly simple and economical in construction, should prove to possess such a durability and freedom from wear and breakdown as to place it, in these respects, far in advance of any type of steam or gas motor of the present day."
- Engineering Magazine: "An entirely new form of prime mover with interesting possibilities."
- Technical World Magazine: "The Tesla Turbine is the apotheosis of simplicity. It is so violently opposed to all precedent that it seems unbelievable."

From Numerous Articles and Comments:

"The turbine is different in principle to any heretofore in use and one which will take less room and less coal than the best engine now running".....
"Turbine of revolutionary design".... "Improvement in dynamics which promises revolutionary results"..
"Results seem revolutionary to the point of staggering the imagination".... "This motor will revolutionize the turbine industry".... "Wonderful motor. Extraordinary mechanical principle".... etc. etc.

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CORPORATION BUREAU

STATE OF NEW YORK

Office of the Secretary of State

Albany, August 9, 1916

Geo. Schereff, Esq.,
Secy., Nikola Tesla Co.,
8 West 40th St., N. Y. City.

Dear Sir:

Enclosed herewith please find check for
\$ 1.25, the amount of overpayment of fees in
relation to the certificate of incorporation
of Tesla Company, Inc.

Yours respectfully,

Secretary of State

J. Georg Scherff,

Drechsler und Eggenmacher.

Nordseebad Altes Land, 17. Sept 1902

Mein geliebtes Kind

Mein lieber Brief habe ich erhalten
er war sehr schön & hat mich sehr erfreut
und ich bin sehr froh dass du dich
so sehr für die Sache interessiert hast
und dass du dich so sehr für die Sache
interessierst. Ich habe dich sehr
gern und ich bin sehr froh dass du
dich so sehr für die Sache interessierst.
Ich habe dich sehr gern und ich bin
sehr froh dass du dich so sehr für die
Sache interessierst. Ich habe dich sehr
gern und ich bin sehr froh dass du
dich so sehr für die Sache interessierst.

Ich bin sehr froh dass du dich so
sehr für die Sache interessierst. Ich
habe dich sehr gern und ich bin sehr
froh dass du dich so sehr für die Sache
interessierst. Ich habe dich sehr gern
und ich bin sehr froh dass du dich so
sehr für die Sache interessierst. Ich
habe dich sehr gern und ich bin sehr
froh dass du dich so sehr für die Sache
interessierst.

J. Georg Scherff,
Turner (lathe) and Harrowmaker

North Sea Spa (Resort)
Ulenbruch
17 Sept 1902

Dearly loved children,

We received your dear letter, but it was all torn open on two sides and reglued here at the post office. It had arrived here with the address damaged. No doubt the mail carriers assumed there was a thousand mark bill in it because it was so thick. We read your letter as well as the newspaper clipping with interest and were amazed at your great enterprise. May it only come about that Mr. Tesla be successful in achieving his acceptance (joining). Then it certainly will not be to your disadvantage. We are happy, dear children, that you feel content there in spite of your isolation, and that you are all healthy. We'd like to see all of you some time, but no doubt that will just remain a wish.

FILE : SCHERFF COLLECTION

Columbia University in the City of New York | New York, N.Y. 10027

THE LIBRARIES

Butler Library

801 Butler Library
April 17, 1979

Mr. Leland Anderson
2525 South Meade Street
Denver, Co. 80219

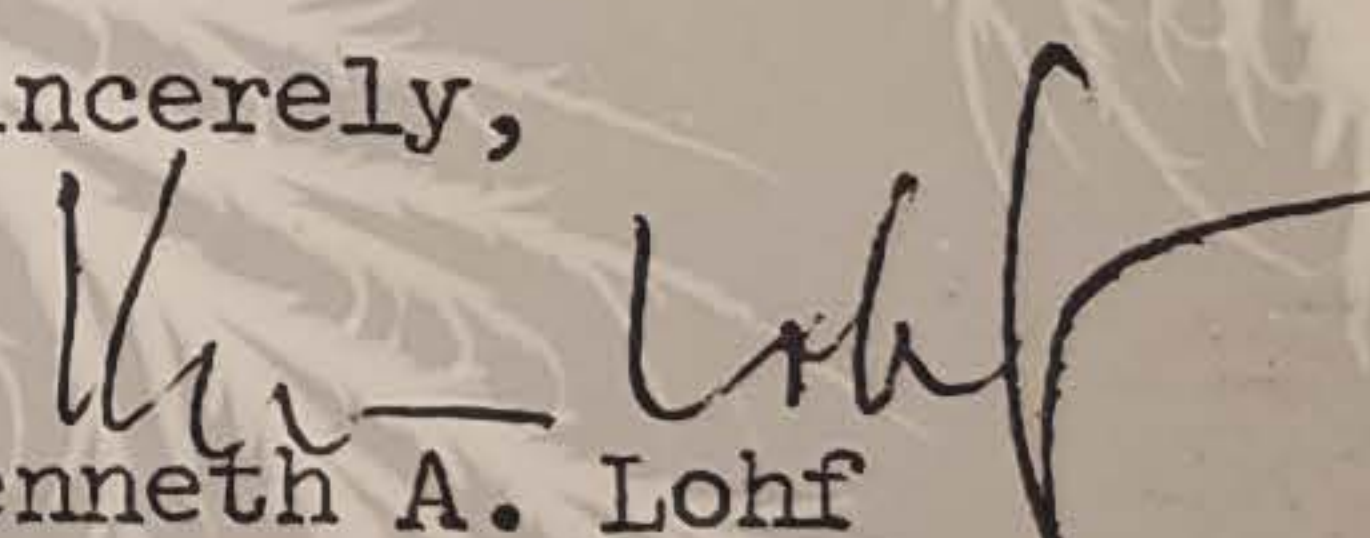
Dear Mr. Anderson:

In reply to your letter of 11 April, we have corrected our catalog cards for the Kiebitz item and checked the photocopies of your other enclosures against our collection. We have found that we don't have enclosures 2 and 4.

We do have enclosures 3 and 5 with one exception: the motor diagram supposed to have been attached to the 29 March 1918 letter to the Wisconsin Electric Company is not present. We have no idea where the lacking items you inquired about are and have no record as to ever receiving them.

All best wishes for the success of your work.

Sincerely,


Kenneth A. Lohf
Librarian for Rare Books
and Manuscripts

6/13/78

Not cataloged in
Columbia University
Special Collections

- 1) H. H. SECRETARY OF STATE AUG. 9, 1916
- 2) J. GEORG SCHERFF 17 SEPT. 1902

April 11, 1979

Mr. Kenneth A. Lohf,
Librarian for Rare Books and Mss.
801 Butler Library
Columbia University in the City of New York
New York, NY 10027

Dear Kenneth:

Nikola Tesla Collection (Scherff Group)

With this letter I hope to provide some information to you and receive information from you that will, taken together, clear up some possible identification problems in the subject collection. As you are probably aware, I am serving as an adviser for a major biographical work on Tesla which is now in progress. It is desirable to cite the source for information that is used or quoted, and hopefully some uncertainties with regard to a few items in the Tesla-Scherff papers can be cleared up.

The following comments and questions are based on the contents of your catalog as of June 1976:

Enclosure 1 relates to the following catalog entry:

Tesla, Nikola
Kiebitz, Franz
For Accompaniment
Berlin-Steiglitz, 4 Mar. 1932
t.ms., 4 p. (Forward (?) to S. Boksan's
book on Nikola Tesla; p. 4 entitled:
Preface). (*Note: an English translation.*)

The enclosure includes a copy of the material covered by the catalog entry plus a copy of the front matter of the book in which the material appeared. Inasmuch as Boksan wrote several books about Tesla, it was my thought that you may want to more precisely identify the book in question.

The remaining four enclosures pertain to materials that I am not certain are in the Tesla-Scherff papers at the Library. They should be, inasmuch as I obtained the enclosure copies while the papers were in the hands of Marianna Garner -- the provenance antecedent.

Enclosure 2 is a copy of the first page (I don't have the remainder) of a letter to George Scherff from some family member in Germany. Note that Tesla is mentioned. Little is known about George Scherff, and this letter is important from the standpoint of helping to provide such information. Also, the substance of the letter could be important insofar as information concerning Tesla's business affairs. Is this in the Library's collection? (If so, I would like to have a complete copy.)

Enclosure 3 is a copy of a letter to George Scherff from Fritz Lowenstein. Note that Tesla is mentioned. This letter is important because of the fact that Lowenstein was Tesla's assistant at Colorado Springs in 1899 where Tesla performed experiments that startled the scientific world, and also worked for Tesla again at his laboratory in Shoreham when he (Lowenstein) returned from Germany. Lowenstein is a controversial figure in Tesla's biography because he (Lowenstein) had agreed to testify in support of the Tesla radio patents in an important case during WWI, but at the last minute switched to support the Marconi radio patents -- raising many unanswered questions about his integrity and provoking the wrath of Tesla's scorn. Is this item in the Library's collection?

Enclosure 4 is a copy of a note to George Scherff from the Office of the Secretary of State of New York. The Library's catalog describes several several stock certificates, incorporation statements, etc., each cited individually, but this item is not included. Is the item, in fact, in the Library's collection?

Enclosure 5 described a correspondence group (11 items) between George Scherff and the Wisconsin Electric Company. The story behind this group is that Tesla used Scherff to write as himself (to conceal his direct involvement) in order to obtain a special motor of his design. This situation becomes apparent as one reads the correspondence and various marginal notes -- the motor diagram (attached to March 29, 1918, letter) is in Tesla's hand. Is this correspondence group in the Library's collection?

If some (or none) of the items described by Enclosures 2 through 5 are in the Library's collection, do you know where they may be? Were they turned back to Mary Benjamin as nonrelevant, for example?

I will be most pleased to receive your comments.

Sincerely,

Leland Anderson

Leland Anderson
2525 South Meade Street
Denver, CO 80219

It may interest Braco to know that there are some plans and negotiations under way to make a film on Tesla. I understand Hollywood is negotiating with the heirs of John O'Neil for the rights on his book. Seems it will be Todd's outfit -- the guy that is dickering to make "War or Peace" according to the papers. Some months ago I spoke on the phone to a young lady in NY who some years ago wrote Braco a letter asking about rights to make a film of Tesla. If he remembers I forwarded the letter to him in Belgrade. I think it was

DRAGO RUBIN

NIKOLA TESLA

OTKRIĆE U BUDIMPEŠTI — POTEŠKOĆE U STRASSBURGU —
KOD EDISONA — NOĆ KUŠNJE I SLAVE — SJENE U LOVO-
RIKAMA — U RODITELJSKOM DOMU — VEČERA U HOTELU
ASTORIJA — NA VISORAVNI COLORADA — U KULI NA LONG
ISLANDU — POSJET FRAKOVA — POZDRAV DOMOVINI

Din 30.

FRITZ LÖWENSTEIN
INGENIEUR.

FRANKFURT A. M. DEN 13. 1. 1902.
Kronprinzenstrasse 38.

Sehr geehrter Herr Scherff !

Heute zurückgekehrt von der Jagd nach Herrn Director Singer beile ich mich Ihnen mitzutheilen, dass ich von demselben die Zustimmung zur vorzeitigen Lösung meines Contractes erhielt. Wir sind nun fest darüber, einen Nachfolger für meinen Posten zu bekommen und hoffe ich, dass derselbe im Laufe der nächsten Woche wird eintreffen können. Die Geschäftsübergabe werde ich dann sehr beschleunigen, kann jedoch den Zeitpunkt meiner Abreise heute noch nicht fixieren. Jedesfalls aber bin ich vor Ende Februar bei Ihnen, worauf ich mich schon sehr freue.

Die Sendung von 250 Dollar, die ich hie mit bestätige und für welche ich Herrn Tesla meinen besten Dank sagen lasse, dürfte bereits mehrere Tage hier am Postamt meiner geharrt haben.

Ich bitte Sie Herrn Tesla meine höflichste Empfehlung bestellen zu wollen.

Mit vielen Grüßen und dem Zuruf "Auf ein recht arbeitsfreudiges Wiedersehen "

Ihr

Fritz Löwenstein

LOUIS H. HAMILTON
PRESIDENT & GEN. MGR.

CHESTER H. BEACH
VICE PRESIDENT

ARTHUR HUGUNIN
SECY & TREAS.

WISCONSIN ELECTRIC COMPANY

INCORPORATED

ELECTRICAL **DUMORE** SPECIALTIES

CABLE ADDRESS
"DUMORE RACINE"

RACINE, WISCONSIN

July 30th, 1918.



MANUFACTURERS
OF

PORTABLE GRINDERS

SEWING MACHINE
MOTORS

FRACTIONAL
H. P. MOTORS

POLISHERS AND
BUFFERS

ELECTRIC DRILLS

CLOTH CUTTERS

VACUUM CLEANERS

BILLIARD TABLE
CLEANERS

CLOTHES CLEANERS

ERASER CLEANERS

BLOWERS

HAIR DRYERS

SHOE DRYERS

DRINK MIXERS

Mr. George Scherff,
17 Battery Place,
New York City, N.Y.

Dear Sir:-

We forwarded to you yesterday your Motor wound as you requested. It went forward C.O.D. for the reason that we have no means of knowing who you are and what credit you are entitled to. We hope that our action will meet with your approval, and that you can establish with us sufficient evidence for credit.

We hope that the Motor will meet your requirements, and after you have examined it, if there are any further corrections to make on it, if you will return it to us, we will be glad to go into the matter with you further.

At the present time we are busily engaged in Government Work and are not giving much attention to this kind of work. However, if you will be patient, we assure you that we will give it our spare time and are most willing to help you.

The price we have quoted you is list for this type of motor, and should orders for quantities be placed, we can quote you more attractively.

Thanking you, we remain

Very truly yours,

WISCONSIN ELECTRIC CO.

PER

RIP:P

LOUIS H. HAMILTON
PRESIDENT & GEN. MGR.

CHESTER H. BEACH
VICE PRESIDENT

ARTHUR HUGUNIN
SECY & TREAS.



WISCONSIN ELECTRIC COMPANY

INCORPORATED

ELECTRICAL DUMORE SPECIALTIES

RACINE, WISCONSIN

June 24th, 1918.

MANUFACTURERS
OF

PORTABLE GRINDERS

SEWING MACHINE
MOTORS

FRACTIONAL
H. P. MOTORS

POLISHERS AND
BUFFERS

ELECTRIC DRILLS

CLOTH CUTTERS

VACUUM CLEANERS

BILLIARD TABLE
CLEANERS

CLOTHES CLEANERS

ERASER CLEANERS

BLOWERS

HAIR DRYERS

SHOE DRYERS

DRINK MIXERS

Mr. Geo. Scherff,
17 Batter Place,
New York City, N.Y.

Dear Sir:-

Your letter of the 18th inst.,
is at hand, regarding the building of a
special motor for you.

We have given the information
enclosed in your letter to our Engineers,
who says this enlightens the proposition
considerably, and they may be able to build
a motor that will meet with your requirements.

When anything further develops,
we will notify you to that effect.

Very truly yours,

WISCONSIN ELECTRIC CO.

PER

C. H. Beach

RIP:P

June 18, 1918.

Wisconsin Electric Company,

Racine, Wisconsin.

Gentlemen:-

I beg to acknowledge receipt of your favor of June 7th, and note that your engineers find it impossible to build a motor with the amperage I specified. In this regard I would say, that it will be immaterial what amperage the motor consumes, the only requirement is that the motor should not overheat under the conditions that it will be used. From my former descriptions you will see that the motor will be at rest most of the time and will operate only occasionally when the arc carbons need feeding. I am not interested in the efficiency of the machine and the power required will be very small.

I have no doubt that your engineers will be able to meet these conditions and hope to hear further from you soon.

Yours very truly,

LOUIS H. HAMILTON
PRESIDENT & GEN. MGR.

CHESTER H. BEACH
VICE PRESIDENT

ARTHUR HUGUNIN
SECY & TREAS.

WISCONSIN ELECTRIC COMPANY

INCORPORATED

ELECTRICAL **DUMORE** SPECIALTIES

CABLE ADDRESS
"DUMORE RACINE"

RACINE, WISCONSIN

June 7th, 1918.



MANUFACTURERS
OF

PORTABLE GRINDERS

SEWING MACHINE
MOTORS

FRACTIONAL
H. P. MOTORS

POLISHERS AND
BUFFERS

ELECTRIC DRILLS

CLOTH CUTTERS

VACUUM CLEANERS

BILLIARD TABLE
CLEANERS

CLOTHES CLEANERS

ERASER CLEANERS

BLOWERS

HAIR DRYERS

SHOE DRYERS

DRINK MIXERS

Mr. Geo. Scherff,
17 Battery Place
New York City

Dear Sir:-

We received your letter of June 3rd referring to a special motor that we contemplated building for you. The writer has taken this up with the Engineers for the third time. They will advise that they will make another effort to make this motor. They state, however, that it is an impossibility to build a motor with the amperes you require. Could you make any better suggestions of this part of the wiring? If you have any good points in building this motor, we would like to have you give them to us. It would perhaps greatly help us in our further experiments.

Our shop is also crowded with a good many Government orders, and are not free to devote much of our time to special work. We will, however, give this order our consideration at a very early period.

Very truly yours,

WISCONSIN ELECTRIC CO.

PER

RIP:P

Was in order in office, and losses of machine. The motor will be as best most of time. He said motor that will not overheat under these conditions.

WISCONSIN ELECTRIC COMPANY

Racine, Wis. June 7, 1918.

Mr. Geo. Scherff,
17 Battery Plc., N.Y.C.

Dear Sir:

We have your letter of June 3rd, referring to the special motor that we contemplated building for you. The writer has taken this up with the Engineers for the third time, and will advise that they will make another effort to make this motor. They state, however, that it is an impossibility to build a motor with the ampere you require. Could you make any better suggestions of this part of the winding? If you have any good points in building this motor, we would like to have you give them to us. It would perhaps greatly help us in our further experiments.

Our shop is also crowded with a good many Government orders, and we are not free to devote much of our time to special work. We will, however, give this order our consideration at a very early period.

Very truly yours,

Wisconsin Electric Co.

(Signed) By R. I. Pease

Dear George:

Please call me up
to-night about this -

Respectfully

Pa

June 3, 1918.

Wisconsin Electric Company,

Racine, Wisconsin.

Gentlemen:-

I beg to acknowledge receipt of your favor of May 28th, and note your remark, that the special motor wound according to my specifications would not develop sufficient power to be of any service. I do not know, of course, under what conditions you have operated the motor, but the fact is, that I have thoroughly tested the idea and wound a motor myself some time ago in the same manner, which operated satisfactorily in connection with my arc controller. I feel confident, therefore, if you would send me the motor that you have constructed and give me an opportunity to test it, that it would be satisfactory. What I want is to find somebody who will make these machines for me in quantity, as I have not the necessary facilities; the other parts of the arc controller I intend to manufacture myself.

Hoping to hear further from you at an early date, I remain,

Yours very truly,

LOUIS H. HAMILTON
PRESIDENT & GEN. MGR.

CHESTER H. BEACH
VICE PRESIDENT

ARTHUR HUGUNIN
SECY & TREAS.



WISCONSIN ELECTRIC COMPANY

INCORPORATED

ELECTRICAL **DUMORE** SPECIALTIES

RACINE, WISCONSIN

May 28, 1918.

MANUFACTURERS
OF

PORTABLE GRINDERS

SEWING MACHINE
MOTORS

FRACTIONAL
H. P. MOTORS

POLISHERS AND
BUFFERS

ELECTRIC DRILLS

CLOTH CUTTERS

VACUUM CLEANERS

BILLIARD TABLE
CLEANERS

CLOTHES CLEANERS

ERASER CLEANERS

BLOWERS

HAIR DRYERS

SHOE DRYERS

DRINK MIXERS

Mr. George Scherff
17 Battery Place,
New York, New York

Dear Sirs:-

We received your letter of the 23rd
referring to a special wound motor that we were
to build for you.

No doubt our reply to your pre-
vious letters has as yet reached you. We
regret to inform you that we cannot serve you
with this kind of a motor. Our Engineers attempted
to build the motor of this kind, and report that
they were unsuccessful in building a motor as you
have outlined, that would develop sufficient power
to be of any service.

Very truly yours,

WISCONSIN ELECTRIC COMPANY

PER

RIP/HCS

May 23, 1918.

Wisconsin Electric Company,
Pacine, Wisconsin.

Gentlemen:-

I beg to refer you to my letter of April 23rd and previous correspondence on the subject of a specially wound motor, which you were to make for me, and inquire when I may expect to receive this machine. There is a large demand for device in which this motor is to be used, I am very anxious to get the business and shall be obliged if you will do what you can to make an early delivery.

Yours very truly,

April 23, 1918.

Wisconsin Electric Company,
Racine, Wisconsin.

Gentlemen:-

Your favor of April 4th reached me only to-day on account of my absence from the City.

I thank you for your readiness to make up the special motor for me and in reply to your questions wish to say the following.

The machines are to be used in connection with arc controllers for moving picture machines and projection lamps. In practice one of the field windings is connected across the arcs and the other across a rheostat in opposite direction, so that when the current through both circuits is equal, the magnetizing effect will be annulled and the motor will be at rest. Then, however, the carbons burn away, the current through one of the circuits will preponderate, the motor will start and operate the carbon feeding mechanism, feeding the carbons together until the current through both circuits is again equal. The motor, therefore, should have a strong starting torque with a weak field.

I should like you to use for this winding one of your universal motors, so that I may be able to make some tests with it on D.C. as well as A.C. The motor will rotate in both directions to take care of any change in the line voltage. In my experiments I have used a small motor of about the size of those used for mixing drinks, and I think that your Type C motor will be of sufficient power at the normal speed. The shaft extension on this motor is of sufficient length.

Trusting that with this additional information you will be able to make up the motor for me, and hoping to hear further from you soon, I remain,

Yours very truly,

C O P Y

WISCONSIN ELECTRIC CO.,
RACINE, WISCONSIN.

April 4, 1918.

Mr. George Scherff,
17 Battery Place,
New York City.

Dear Sir:

Your letter of March 29th, is received
in reply to ours of March 25th.

We have given this drawing to our engineer
who reports that the diagram is very clear, but for our
information we must know the following:

What current is to be wound for: A.C. or
D.C.? What direction of rotation is necessary and what is
the approximate H.P. required at any given speed? Is the
shaft extention on the Type C of the correct length?

It would further aid us in building this motor
if you know, and if you care to tell, what you are using this
machine for.

We would state definitely that we will be glad
to build this motor for you.

Thanking you to give us this information, we
remain,

Very truly yours,

Wisconsin Electric Co.

March 29, 1918.

Wisconsin Electric Company,
Racine, Wisconsin.

Gentlemen:-

I beg to acknowledge the receipt of your favor of March 25th, in reply to my letter of the 21st. I find that I have not made myself clear, as you do not seem to have understood my question. I am aware, of course, that you do not have differentially wound motors in stock, and my inquiry had the purpose of asking, if you would be willing to make such a machine for me. What I need is merely a special field winding on one of your regular motors, and I enclose a diagram showing this winding. The fields should be wound with two wires, both wires being wound at the same time, thus making two coils for each field. One set of these field coils should be connected in series - see circuit A of diagram - and the other set should be connected in series with the armature - see circuit B of diagram - and the four terminals brought out. Another important requirement is, that each one of the circuits A and B should take no more than about one-twentieth ampere on a 60 volt circuit. I believe that your type C motor would suit my purpose, if it is possible to get the required field windings into this motor, otherwise a type D motor will do. Your engineer, of course, will have no difficulty in determining this from the data given.

I beg to enquire again, if you are willing to make up this machine for me for a test, and if so, let me know your price

Wisconsin Electric Co. May 29, 1918.

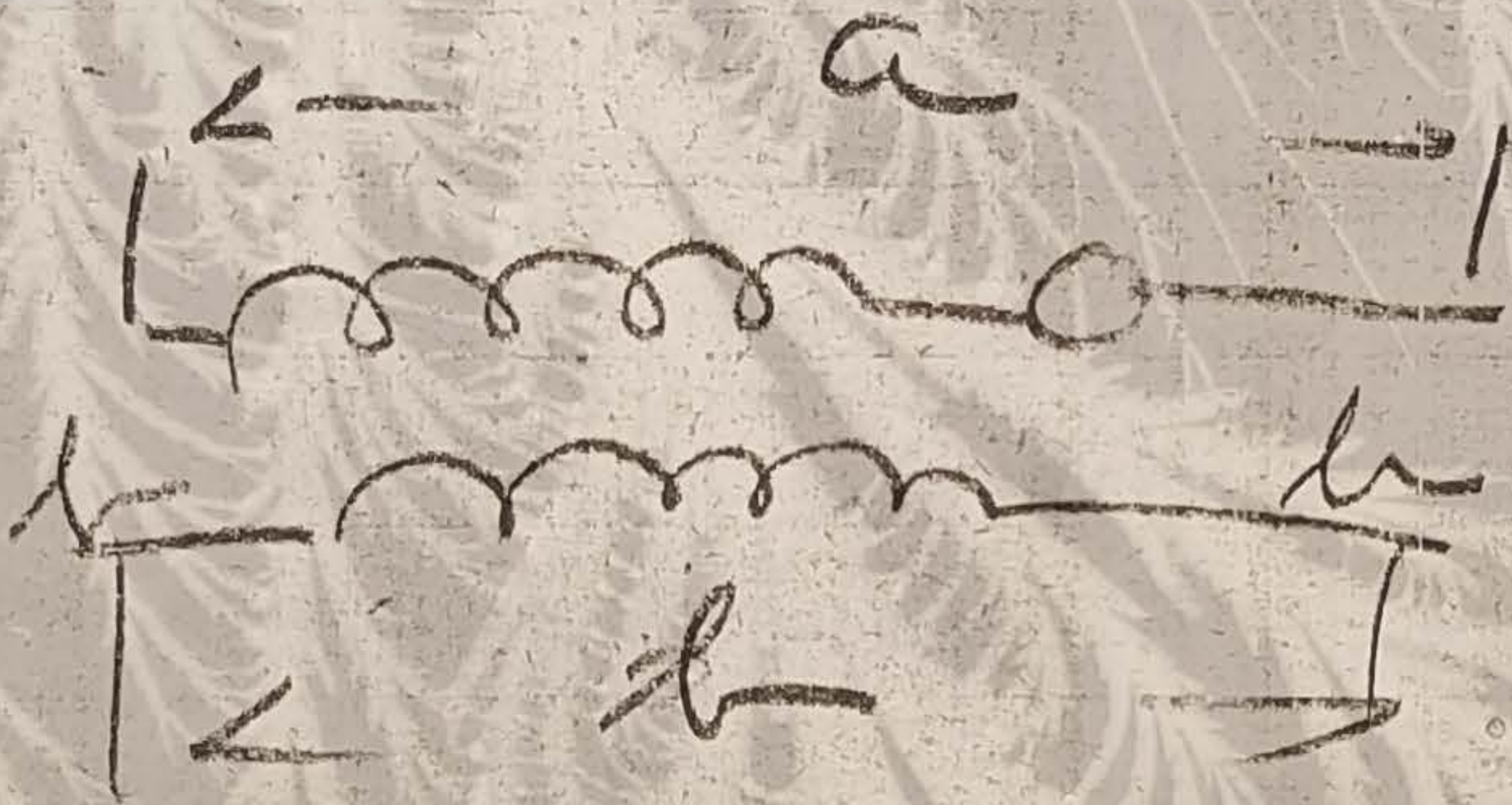
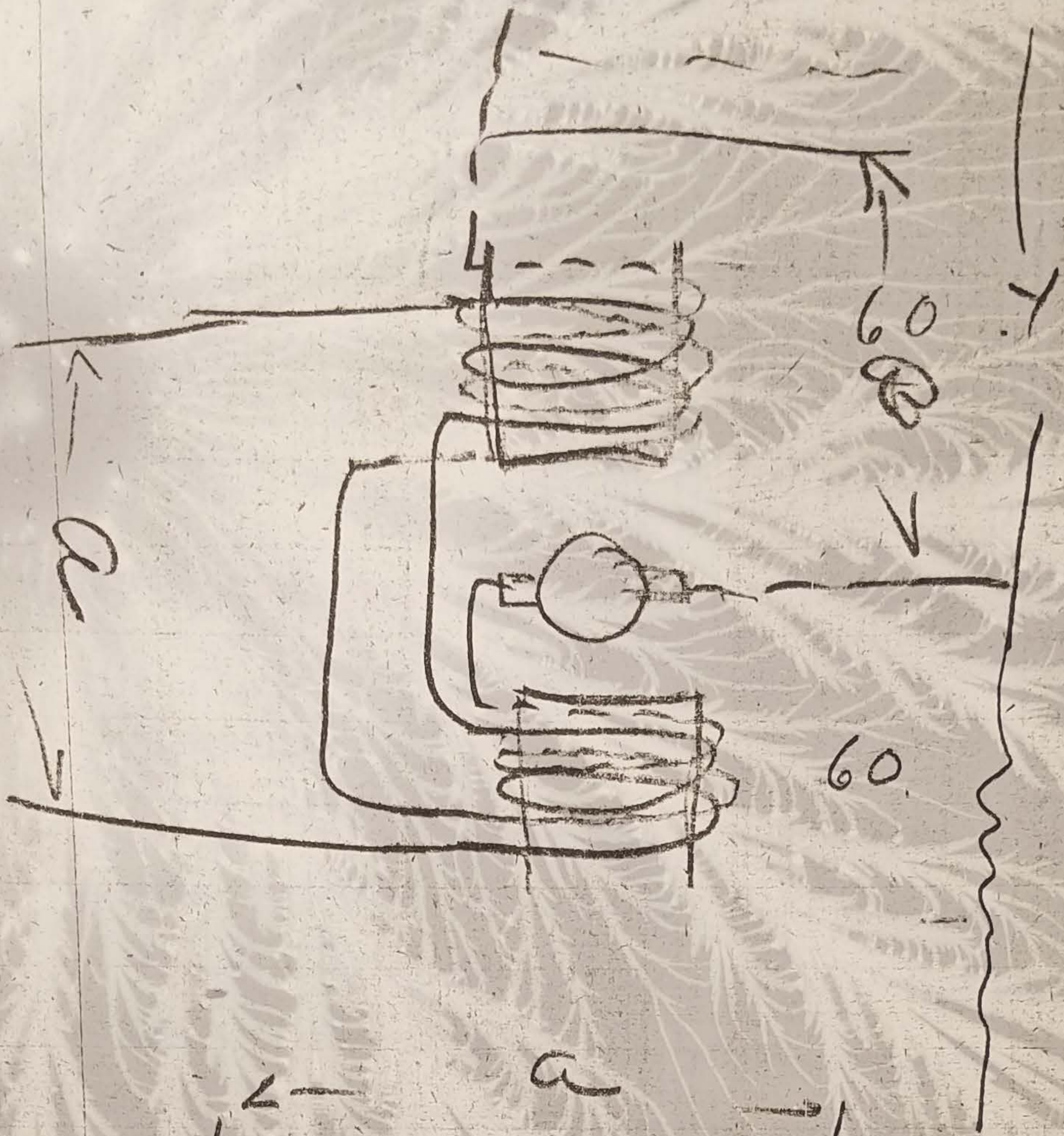
-2-

of the same in lots of one, two and three hundred.

Your machine has been recommended to me by Mr. Nikola Tesla, and therefore I should like to use it in connection with my controllers.

Yours very truly,

Encl.



36
15
11

Wind field coils with two wires - winding both at the same time. One set of field windings to be connected in series, see circuit A. and two terminals also brought out. The other set of field windings should be connected in series with the armature, see circuit B. Each circuit to take no more than 60 volts.

March 21, 1918.

Wisconsin Electric Company,
Racine, Wisconsin.

Gentlemen:-

Your address has been furnished me by Mr. Nikola Tesla, whom I consulted concerning a specially wound motor which I require. What I need is a differentially wound motor of a fractional horse-power, and I beg to inquire if you would be willing to make up such a machine for me. If so, kindly send me a pamphlet showing the sizes and types of motor you manufacture and I shall send you full specification.

The motor is intended for use in connection with a new kind of circuit controller, for which there seems to be a considerable market.

Yours very truly,

ident
is the

Le

my

of

of

1876

by

to

NIKOLA TESLA, Electrician, Physicist and inventor, born 1857 in Smiljan, Lika, border country of Austria-Hungary, as the son of a distinguished Greek clergyman and orator, and of Georgiana Mandic, a famous woman and inventor, whose father was also an inventor. His education began in the elementary school of his native place, continued four years in the public school in Gospić, Lika; four years in Lower Real School in Gospić, and three years in Higher Real School, Carlstadt, Croatia, where he was graduated in 1873. Originally he was destined for the clergy, but prevailed upon his parents to send him to the Polytechnic School in Gratz, where for four years he studied mathematics, physics and mechanics, following with two years in philosophical studies at the University of Prague, Bohemia. He began his practical career 1881, in Budapest, Hungary, where he made his first electrical invention, a telephone repeater, and conceived the idea of his rotating magnetic field; thence he went to France and Germany, where he was successively engaged in various branches of engineering and manufacturing; since 1884 he is a resident in the United States, of which he is a naturalized citizen.

Mr. Tesla is the author of numerous scientific papers and addresses, and honorary or regular member of many scientific societies, institutions and academies in the United States and abroad; he is a life member of the British Association for the advancement of Science and a Fellow of the Royal Institution of Great Britain; M. A. of Yale and L.L.D. of Columbia, both degrees being honorary, and a Doctor of Science of the Vienna Polytechnic School, the latter distinction being conferred upon him in acknowledgment of his discoveries of the principles of wireless power transmission; the Elliott Cresson gold medal was awarded him in recognition of original work first presented before the Franklin Institute and the National Electric Light Association in 1893, in which wireless transmission was one of the most important chapters.

Among his inventions and discoveries are: System of arc-lighting, 1886; Tesla motor and system of alternating current power transmission, popularly known as two-phase, three-phase, multi-phase or poly-phase systems, which have created

a revolution in electrical engineering and are now universally adopted (1888); system of electrical conversion and transmission by oscillatory discharges, 1889; generators of high-frequency currents and effects of these, 1890; transmission of energy through a single wire without return, 1891; the Tesla coil or transformer, which has proved an indispensable adjunct in wireless transmission, 1891; investigations of high-frequency effects and phenomena, 1891 - 93; system of wireless transmission of intelligence, 1893; mechanical oscillators and generators of electrical oscillations, 1894-95; his researches and discoveries in novel radiations, material streams and emanations, ^{were} published in a series of papers in the Electrical Review, New York, 1896 - 1898, in which he announced all the salient phenomena later attributed to radium; high-potential magnifying transmitter, 1897; system of transmission of power without wires, 1897 - 1905; economic transmission of energy by refrigeration, 1898; art of Telautomatics, 1898-99; discovery of stationary electrical waves in the earth, 1899; burning of atmospheric nitrogen, and production of other electrical effects of transcending intensities, 1899-1900; method and apparatus for magnifying feeble effects, 1901-1902; art of individualization, 1902-1903; the development of his system of world-telegraphy and telephony and of the transmission of power without wires has engaged much of his attention since that time. A number of discoveries in the electrical field made by Mr. Tesla, ^{but} which he has not yet announced, he considers of greater importance than any electrical work he has so far done. His most important recent work is the discovery of a new mechanical principle, which he has embodied in a great variety of machines, as reversible gas and steam turbines, pumps, blowers, air compressors, water turbines, mechanical transformers and transmitters of power, hot-air engines, etc. This principle enables the production of prime movers capable of developing ten horse-power, or even more, for each pound of weight. By their application to aerial navigation, and the propulsion of vessels high speeds are practicable, and the results so far obtained are very promising.

a revolution in electrical engineering practice and are now universally adopted
(1888); novel system of electric lighting by Tesla tubes, 1891;

MECHANICAL THERAPY

H. H. HALL

In order to convey a clear idea of the significance and revolutionary character of this discovery it is indispensable to make a brief statement regarding ELECTRICAL THERAPY.

Fifty years ago, while investigating high frequency currents developed by me at that time, I observed that they produced certain physiological effects offering new and great possibilities in medical treatment. My first announcement spread like fire and experiments were undertaken by a host of experts here and in other countries. When a famous French physician, Dr. D'ARSONVAL, declared that he had made the same discovery, a heated controversy relative to priority was started. The French Academy to honor their countryman, made him a member of the Academy, ignoring entirely my earlier publication. Resolved to take steps for vindicating my claim, I went to Paris, where I met Dr. D'ARSONVAL. His personal charm disarmed me completely and I abandoned my intention, content to rest on the record. It shows that my disclosure antedated his and also that he used my apparatus in his demonstrations. The final judgment is left to posterity.

Since the beginning, the growth of the new art and industry has been phenomenal, some manufacturers turning out daily hundreds of sets. Many millions are now in use throughout the world. The currents furnished by them have proved an ideal tonic for the human nerve system. They promote heart action and digestion, induce healthful sleep, rid the skin of destructive eruptions and cure colds and fever by the warmth they create. They vivify atrophied or paralyzed parts of the body, allay all kinds of suffering and save annually thousands of lives. Therefore in the profession have assured me that I have done more for humanity by this medical treatment than by all my other discoveries and inventions. Be that as it may, I feel certain that the MECHANICAL THERAPY, which I am about to give to the world, will be of incomparably greater benefit. Its discovery was made accidentally under the following circumstances.



- 8 -

I had installed at the laboratory, 35 South Fifth Avenue, one of my mechanical oscillators with the object of using it in the exact determination of various physical constants. The machine was bolted in vertical position to a platform supported on elastic cushions and, when operated by compressed air, performed minute oscillations absolutely isochronous, that is to say, consuming rigorously equal intervals of time. So perfect was its functioning in this respect that clocks driven by it indicated the hour with astronomical precision. One day, as I was making some observations, I stepped on the platform and the vibrations imparted to it by the machine were transmitted to my body. The sensation experienced was as strange as agreeable, and I asked my assistants to try. They did so and were mystified and pleased like myself. But a few minutes later some of us, who had stayed longer on the platform, felt an unspeakable and pressing necessity which had to be promptly satisfied, and then a stupendous truth dawned upon me. Vividly, these isochronous rapid oscillations stimulated powerfully the peristaltic movements which propel the food-stuffs through the alimentary channels. A means was thus provided whereby their contents can be perfectly regulated and controlled, with or without the use of drugs, specific poisons or internal applications whatever.

When I began to practice with my assistants MECHANICAL THERAPY we used to finish our meals quickly and rush back to the laboratory. We suffered from dyspepsia and various stomach troubles, biliousness, constipation, flatulence and other disturbances, all natural results of such irregular habit. But after only a week of application, during which I improved the technique and my assistants learned how to take the treatment to their best advantage, all these forms of sickness disappeared as by enchantment and for nearly four years, while the machine was in use, we were all in excellent health. I cured a number of people, among them my great friend



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Mark Twain whose books saved my life. He came to the laboratory in the worst shape suffering from a variety of distressing and dangerous ailments but in less than two months he regained his old vigor and ability of enjoying life to the fullest extent. Shortly after, a great calamity befell me: my laboratory was destroyed by fire. Nothing was insured and the loss of priceless apparatus and records gave me a terrific shock from which I did not recover for several years. The enforced discontinuance of MECHANICAL THERAPY also caused me deep regret. I had evolved a wonderful remedy for ills of inestimable value to mankind and invented apparatus offering unbounded commercial possibilities but when I came to consider practical introduction I realized that it was entirely unsuitable. It was big, heavy and noisy, called for a continuous supply of oil, part of which was discharged in the room as fine spray; it consumed considerable power and required a number of objectionable accessories. During the succeeding years I made great improvements and finally evolved a design which leaves nothing to be desired. The machine will be very small and light, operate noiselessly without any lubricant, consume a trifling amount of energy and will be, to my knowledge, the most beautiful device ever put on the market. The intention is to exhibit it in action at the occasion of my annual reception in honor of the Press which has been, unfortunately, delayed this year, and I anticipate that it will elicit great interest and receive wide publicity. Unless I am grossly mistaken it will be introduced very extensively and, eventually, there will be one in every household.

The practical application of MECHANICAL THERAPY through my oscillators will profoundly affect human life. By insuring perfect regularity of evacuations the body will function better in every respect



and life will become no much safer and more enjoyable. One of the most important results will be the great reduction -- amounting possibly to seventy-five per cent -- in the number of heart failures, which are usually caused by some acute upset of the digestive process and normal operation of the stomach. Another vital improvement will be derived from the quickened removal of toxic excretions of organs affected by disease. It is reasonable to expect that through this and other healthful actions ulcers and similar internal lesions or abscesses will be cured and relief might be obtained even in case of a cancer or other malignant growth. Skilled physicians and surgeons will be able to perform veritable miracles with such oscillations. They stimulate strongly the liver, spleen, kidneys, bladder and other organs and by these desirable actions they must contribute not a little to well being. Persons suffering from anemia of any form will be especially helped by the treatment. But the greatest benefit will be derived from it by women who will be able to reduce without the usual tantalizing abstinences, privation, sacrifice of time and money and torture they have to endure. They will improve much in appearance, acquire clear eyes and complexions and it may be safely predicted that long continued treatment will bring forth feminine beauty never seen before. It is not to be forgotten that the elimination of countless drugs, patent medicines and specific remedies of all kinds taken internally, by which millions of people doom themselves to an early grave, will be of untold good to humanity.

THE NEW TESLA ELECTRIC HEATER.

STRICTLY CONFIDENTIAL.

This device is greatly superior to the usual flat coil type in efficiency and other respects. It consists of a thin polished metal tube acting as reflector and a base equipped with switch and connecting terminals, and carrying spaced resistor wires concentric with the tube and at a certain distance from the inner surface of the same. In this arrangement the diffuse radiation is virtually eliminated, and the heater operates as if the resistor were not present, the rays being projected from the reflector radially to the central or focal region occupied by the boiling pot.

The principal advantages thus secured are the following:

1. A very high efficiency, as much as 96% being attainable.
2. The efficiency is practically the same whether the pot is large or small, since the density of the rays is inversely as the diameter of the vessel.
3. Due to these features the current consumption is hardly more than half of that in the best heaters of the type referred to.
4. The resistor has a relatively much longer life and can be made to last almost indefinitely in some cases. Also less wire can be used if desired.
5. The heat being largely confined to the range, the kitchen remains comparatively cool.
6. Another practical advantage is greater safety from a variety of accidents frequently occurring with ordinary ranges.
7. The new heater is especially adapted for use on shipboard, Pullman cars, aerial vehicles and automobiles.
8. Likewise it is suitable for all kinds of service on the table, being free from the objections of the present type.
9. It saves considerable time in certain applications.
10. Owing to simplicity, the cost of manufacturing is low.

the subject you wish to write
about. In order to explain this
phenomenon Einstein has
invented the quantity "lambda"

My theory of gravitation
explains this phenomenon
perfectly

N. T. April 18. 1932.

We read a great deal about ~~the~~
~~cosmic rays~~ matter being
changed into force and force
being changed into matter
by the cosmic rays. This is
absurd. It is the same as
saying that the body can be
changed into the mind, and the
mind into the body. We know
that the mind is a functioning
of the body, and is the same
as the body. Force is a function of
matter. Without a body there
can be no mind, without matter
there can be no force.

Einstein has for years developed
formulas explaining the mechanism
of the cosmos. In doing this he
overlooked an important factor,
namely the fact, namely that some
of the heavenly bodies are increasing
in distance from the sun. This
is the same as writing for a
business letter and forgetting

PROSPECTUS FOR MR. TESLA'S NITRATES COMPANY.

Has evolved
a new and
efficient
process for

~~Mr. Nikola Tesla, whose~~ ^{discoveries} ~~inventions in high frequency~~
~~have formed the basis of so many~~ ^{important}
~~more recent practical applications of electricity, and which by~~
~~their world-wide recognition have given this inventor a pre-eminent~~
~~position in the field of electricity, has, by a series of discover-~~
~~ies attending over many years, and all protected by broad patents~~
~~in all the great countries of the world, involved a system for~~
~~the fixation of atmospheric nitrogen,~~ ^{that is, its chemical combination with}
~~the oxygen of the atmosphere into~~ ^{air}
~~a fixed compound (nitric acid or its compounds), which, by its~~
~~tremendous value and wide-reaching influence, bids fair to outrank~~
~~many times his wonderful invention of the alternating current motor.~~
~~Mr. Tesla in a field peculiarly his own, has discovered -~~ (over)

~~First, that his high-frequency electric dischargers in~~
~~the atmosphere give in a much more effective degree a peculiar~~
~~electric chemical stress, which brings about this most difficult~~
~~of combinations; a stress which all workers in this field have~~
~~recognized for years as being one which not only must be of~~
~~tremendous power, but of almost infinite suddenness. The time~~
~~element which has so materi-~~ ^{interfered with the success of}
~~ally hindered with the success of~~
~~other workers in this field, by Mr. Tesla's invention, been~~
~~almost entirely removed as a~~ ^{objection.}

~~Second, Mr. Tesla~~ ^{another means of obtaining phenom-}
~~enally high voltages (trans-~~ ^{the millions of volts) from}
~~mitters of most moderate~~ ^{apparatus enables him to obtain the}

early ~~the first~~ to
+ He ~~has~~ recognized the immense possibilities of such
a departure, and ~~in~~ ¹⁸⁹⁰ published a few years
ago he made the ~~prediction~~ prediction that ~~the~~ ^{nitrogen} ~~industry~~
the electric fixation of atmospheric nitrogen would before long develop into
an industry next to that of iron ^{importance}. At that time nothing had been
done towards commercial exploitation. Now time and his foresight is
shown by the fact that in various countries extensive
plants have been erected ^{a large investment has been made}. In
Norway, ~~which alone~~ ^{alone} ~~the~~ ^{120,000 tons of nitric acid}
Lorraine and elsewhere ^{is contemplated and fifty million dollars have been already engaged in the industry}.
~~for~~ ^{all of these undertakings} ~~are based~~
~~on the~~ ^{on the} ~~old~~ ^{and crude} ~~method~~ ^{method}

Method and apparatus utilizing no more than a few percent
of the electric energy of the current, and calling for a
first cost so great, ~~that the~~ ^{that the} interest and maintenance charges have rendered the
business indifferently attractive to capital.

4 The fixation or burning of atmospheric nitrogen
is effected economically ~~by~~ ^{by} lightning discharges, which
precipitate from four to twenty pounds of nitrogen-
ous compounds per acre per year, an enormous amount
when considering their scarcity. This high efficiency
is due to the great power, suddenness, length and volume of
the discharge, and instant cooling, resulting therefrom.

4 These ideal requirements are fulfilled in
the new ~~process~~ ^{which is the result of years of labor and is now} process owned by the Tark Nitrate Company.

4 The "Tark Transformer" ^{which is possible to obtain} ~~available~~ ^{the production of}
electrical effects of virtually unlimited power, surpassing
even those of lightning, ^{as has been demonstrated in actual experiments by its inventor.}

4 The "high frequency" or so-called Tark currents ~~are~~
have the peculiar property of exciting the dormant effi-
cacies of nitrogen, causing the gas to combine ^{more readily and} with
a lesser expenditure of energy.

XXXX

~~attenuated are so necessary for the highest efficiency.~~

~~Third, by virtue of the peculiar nature of Mr. Tesla's transformer, he is enabled to produce a certain tonnage of product with such a small amount of apparatus and a consequently reasonable investment as to multiply a thousand-fold, the capacity efficiency of his plant. This item is of vast importance in connection with this subject. Many experimenters have produced nitric acid from the atmosphere and there are now some very large plants engaged in this industry, one particularly in Norway, that involves upwards of \$50,000,000, and which will absorb some 200,000 horse power when it is fully expanded, but without exception all these efforts have resulted in a first cost of apparatus so great that the interest and maintenance alone thereof puts a fixed charge upon each ton of the product that has heretofore rendered the business indifferently attractive to capital. Ignoring, there-~~

~~for the moment, the increased efficiency claimed by Mr.~~

~~Tesla, or his novel method of burning the atmosphere, and granting~~

~~only that he shall burn it as it has been done before by attenuated~~

~~that his devices are applied to the old process, the commercial~~
~~ere, it will be readily seen that if he can reduce the cost of the~~
~~advantages secured will still be such as to make the success~~
~~apparatus from \$100. per ton of output to \$8. or less, it simply~~
~~of the project absolutely certain, if power can be had at a reasonable price, for~~
~~remains to get power at a sufficiently reasonable price to make~~

~~for the present, instead of costing \$50. per ton of product is~~
~~the project absolutely certain. Pure nitric acid~~
~~the plant, instead of costing 80-100 dollars per ton of annual product, will cost for an~~
~~and its salts (and all nitrates prepared thus from the atmosphere~~
~~are pure) sold from \$100. to \$200. per ton, and even the crude~~
~~corresponding expenditure of eight dollars, or less. For nitric acid and its salts, the~~

~~of the nitric acid and its salts thus prepared are of great purity and sell at~~
~~articles of commerce, such as the Chili saltpeter, with 5% of~~
~~100-200 dollars per ton. Its purity is (end of line)~~
~~impurities, sell for \$55. and better. It will therefore be~~
~~what a small charge of investment of \$8. or \$10. per ton of put-~~

~~put becomes. The operation of these plants, like those of hydre-~~

~~electric installations, require but little labor. There is no essential~~
~~and care.~~

xxxx & Their inconceivable suddenness, removes one great obstacle which has so materially interfered with the success of the old method and appliances.

& Tesla means for generating enormous electric pressures with apparatus of surprisingly small dimensions, enables the production of discharges or arcs of the great length and volume so necessary to the highest efficiency.

By this means it is possible to operate units of any capacity, however great, to burn the air at any desired rate and thus increase a thousand fold the effectiveness of the plant. The Tesla apparatus may be likened to a turbine running at a stupendous speed, while that ~~now~~ ~~employed~~ is comparable to an old fashioned engine turning slowly. For the same performance the latter is ever so much more cumbersome and expensive. ~~This is a ~~very~~ ~~long~~ ~~and~~ ~~costly~~ ~~and~~ ~~fixed~~ ~~charge~~~~

& This is of vital importance to the enterprise reducing as it does, to a minimum the first cost and ^{the burden of} fixed charges. To illustrate, ~~namely~~ that disregarding x x (other side)

part ^{of the plant} ~~which is~~ subject to rapid ^{deterioration} ~~wear and tear~~; in fact, most of it is ^{not} ~~good for one hundred years~~, as it consists principally of brick ^{and metal and is good for centuries} ~~buildings, transformers, brick or tile combination chambers and equipment, towers or their equivalent~~. The process is a continuous one and once started ^{needs} ~~requires~~ no manual labor, ^{it is} ~~the electricity~~ ^{electrically} continuing to burn the atmosphere into nitric fumes, which in turn combine with water to make nitric acid, and this goes on until the ~~current~~ ^{current} is switched off, and immediately recommences when the ~~current~~ ^{current} is ~~again~~ switched on.

There is no loss upon the discontinuing of the process for an hour, a day, a month or a year, ^{other than} ~~except~~ that ~~is~~ ^{the} due to plant lying idle and carrying its ^{no small} ~~burden~~ of interest. It is obvious, therefore, that ~~it only remains to obtain power at a sufficiently reasonable price to make an almost unlimited industry of this~~ ^{can be built up} ~~with a very reasonable investment of capital yielding annually a return many times the first cost.~~

The Tesla Nitrates Company owns the exclusive rights under ~~the~~ ^{and} United States patents granted to ~~Mr.~~ Tesla, applicable to the manufacture of nitrates from the atmosphere, ~~which are the following:~~

^{It will be his own} ~~his~~ future ~~improvements~~ ^{improvements} when they shall be made, relative to this subject, ^{and will get the benefit of his assistance and advice.}

^{insert paragraph here} ~~It is proposed to immediately make a demonstration of the~~ ^{salient advantages of the novel process with a model plant} ~~on the commercial magnitude in the immediate vicinity of New York~~

City, where experts and investors may see ~~for themselves~~ ^{and judge for themselves of their value} the practical application of ~~these~~ ^{his} inventions, ~~in a full sized unit~~

~~apparatus. In making this test, Mr. Tesla will have at his disposal, a plant that has already cost over \$200,000, a large part of which will be immediately available. It is estimated that this test will involve an expenditure of \$25,000 for the~~ ^{will be ample to meet}

ishing of the additional apparatus, partly for attendance and
all expenses in this connection. Incidentally this plant will serve
operation and partly for the very full and exhausted demonstra-
the important purpose of exhaustively testing the latest improvements
tion which it is proposed to be made.
prior to their application on the large scale contemplated.

XXXX ~~off~~ Tesla is now devoting himself to
the perfection of plans for ~~large~~ ^{installation} ~~large~~ ^{plant}
being assisted in this work by a ~~man~~ ^{man}
premier ^{of international repute} engineer who ~~has been for a long time~~
~~has been for a long time~~
a long experience in the fixation of Nitrogen
by the old method and is thoroughly familiar
with all ~~the~~ ^{the} facts pertaining to the manufacture
and sale of the products. In the mean
time X K

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TESLA'S NEW SYSTEM OF FLUID PROPULSION

In subduing the forces of Nature to his service man must invariably avail himself of some process in which a fluid acts as carrier of energy, this being an essential step in any industrial undertaking dependent on mechanical power. Evidently then, a discovery or radical departure in that domain must be of extreme importance and far-reaching influence on the existing conditions and phases of modern life.

Fluid propulsion is now effected by means of pistons, vanes or blades, which entail

complexity of construction and impose many limi-

tations on the propelling as well as propelled mechanism and its performance. Tesla has dispensed with these devices and produced machines of extraordinary simplicity which, moreover, are in many other respects superior to the old types universally employed. A few words will be sufficient to convey a clear idea of his invention.

Every fluid, as water or air, possesses two salient properties: adhesion and viscosity. Owing to the first it is attracted and clings to a metallic surface; by virtue of the second it resists the separation of its own particles. As an inevitable consequence a cor-

tain amount of fluid is dragged along by a body propelled through it; conversely, if a body be placed in a fluid in motion it is impelled in the direction of movement. The practical forms of Tesla's apparatus consist of flat, circular disks, with central openings, mounted on a shaft and enclosed in a casing provided with ports at the peripheral and central portions. When deriving energy from any kind of fluid it is admitted at the periphery and escapes at the centre; when, on the contrary, the fluid is to be energized, it enters in the centre and is expelled at the periphery. In either case it traverses the in-

terstices between the disks in a spiral path, power being derived from, or imparted to it, by purely molecular action. In this novel manner the heat energy of steam or explosive mixtures can be transformed with high economy into mechanical effort; motion transmitted from one shaft to another without solid connection; vessels may be propelled with great speed; water raised or air compressed; an almost perfect vacuum can be attained, substances frozen and gases liquefied.

While this improvement has the broadness and applicability of a fundamental mechanical concept, the widest field for its

commercial exploitation is, obviously, the thermodynamic conversion of energy.

The commercial value of a prime-mover is determined by its efficiency, specific performance relative to weight and space occupied, cheapness of manufacture, safety and reliability of operation, adaptability to construction in large units, capability of running at high peripheral velocity, reversibility, and a number of other features of lesser importance. In the majority of these a machine, operating on the new principle, excels. But there is one quality which is most desirable in a thermo-dynamic transformer from the

economic point of view, and that is great resistance to deterioration and impairment of efficiency by heat.

The employment of high temperature is of such vital bearing on the efficiency of prime-movers that it is of paramount importance to extend the thermal range as far as practicable. In the present state of the art radical progress towards a more economical transformation of the energy of fuel can only be achieved in that direction. Such being the case, the capability of the machine to withstand deteriorating effects of great heat is the controlling factor in determining its commercial value. In that most desired quality the

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Tesla turbine surpasses all the older types of heat motors. The Diesel and other internal combustion engines are fatally limited in this respect by their complete dependence on closely fitting sliding joints and unfailing supply of clean lubricant; while in the present forms of turbines buckets, blades and inherent mechanical deficiencies impose similar restrictions. These parts are too delicate and perishable to serve as elements of a gas turbine and this has been the main obstacle in the way of its successful realization. The rotor of the Tesla turbine presents a relatively enormous

active area and the wear is quite insignificant as the fluid, instead of striking against the propelling organs in the usual destructive manner, flows parallel with the same, imparting its momentum by adhesion and viscosity instead of impact. Moreover it has been shown that the efficiency of this form of rotor is not impaired to any appreciable degree by a roughening of the disks and that it operates satisfactorily even if the working medium is corrosive to an extent.

The universal adoption of steam as motive power under certain standard conditions, settled upon in the course of time, gradually forced upon the minds of engineers the Rankine

Anderson,
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Cycle Efficiency as criterion of performance and long continued endeavors to improve the same have finally resulted in complex multistage constructions entirely unsuitable for high temperatures. The Tesla turbine, by virtue of its exceptional heat-resisting and other unique properties, makes possible the attainment of great fuel economy with but a single stage, incidentally offering the additional advantages of an extremely simple, small, compact, and reliable mechanism. But perhaps the chief commercial value of this new prime-mover will be found in the fact that it can be operated with the cheapest grade of crude oil, colloidal fuel, or powdered coal, containing con-

siderable quantities of grit, sulphur and other impurities, thus enabling vast sums of money to be saved annually in the production of power from fuel.

The Tesla turbine also lends itself to use in conjunction with other types, especially with the Parsons with which it forms an ideal combination. Although its practical introduction has been delayed by the force of circumstances, a number of years have been spent in exhaustive investigations and experiments on the basis of which the performance in any given case can be closely calculated. The first public tests were made before the

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outbreak of the war at the Waterside Station
of the New York Edison Company where several
machines, ranging from 100 to 5000 h.p., were
installed and operated with satisfactory re-
sults. That the invention was appreciated
by the technical profession may be seen from
the excerpts of statements by experts and
periodicals printed on the annexed page.

The salient advantages of the
Tesla turbine may be summed up as follows:

EFFICIENCY: The most economical of the
present prime-movers is the Diesel engine.

But, quite apart of many practical and com-

mercial drawbacks, inseparable from this type, it is entirely dependent on comparatively expensive oil, so that the Tesla Gas Turbine, working with much cheaper fuel, would have the better in competition even if its efficiency as a thermodynamic transformer were appreciably lower, all the more so in view of its greater mechanical perfection.

Referring to turbines, all of which are surpassed by the Parsons in economy as well as extent of use, definite limits have already been reached and the only possibilities of saving fuel exist in the employment of steam at very high superheat

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and utilization of gas or oil as motive fuel.

But none of the primemovers mentioned is adapted for such operation and although every effort has been made in this direction, no signal success has been achieved. The superheat is at most 250° F. this being considered the maximum permissible. All attempts to considerably extend the thermal range have failed chiefly because of the inability of bucket structures to withstand the action of intense heat. The Tesla Turbine can operate quite satisfactorily with the motive agent at very high temperature and, owing to this quality,

lends itself exceedingly well to these purposes.

SPECIFIC PERFORMANCE: In this particular it is superior to all other forms. Each disk is virtually the equivalent of a whole bucket wheel, and as many of them take up but a small width the output of the machine, considering its weight and size, is surprisingly great. This, while not being a measure of efficiency, is nevertheless a feature of considerable importance in many instances.

CHEAPNESS OF MANUFACTURE: The new turbine can be produced without a single machined part except the shaft, all the disks being punched

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and the casings pressed. By this method, with proper machinery installed on a large scale, the cost of production may be reduced to a figure never deemed possible in the construction of an engine. What is more, this can be done without material sacrifice of efficiency as small clearances are not essentially required.

SAFETY AND RELIABILITY OF OPERATION: There is an ever present danger in the running of high speed machines. A bucket turbine may at any moment run away and wreck the plant. Such accidents have happened again and again and this

peril has often proved a deterrent to investment.

A remarkable quality of this turbine is its complete safety. As regards the wear and tear of the propelling organs it is significant and, in any event, of no consequence on the performance.

ADAPTABILITY TO CONSTRUCTION IN LARGE UNITS: In

all the present machines there is a distinct limit to capacity, for although large units can be manufactured, they are very costly and difficult to manage. The new turbine is so simple and the output so large that the limits in this direction can be greatly extended.

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RESISTANCE TO DETERIORATION BY HEAT AND OTHER

AGENTS:

In this feature again it has an overwhelming advantage over the old types in which the maintenance of smooth surfaces and sharp edges is indispensable to efficient working.

In the Tesla Turbine, for the reasons already stated, the destructive actions of heat and corrosive agents are much less pronounced and of relatively negligible effect. This fact has a most important bearing on the saving of fuel.

CAPABILITY OF RUNNING AT HIGH PERIPHERAL SPEED:

In this respect also it is superior to others. The rotating structure carries no load and is

excellently adapted to withstand tensile stresses. Judging from the most recent turbine practice this quality should be of special value.

REVERSIBILITY: The present turbines are greatly handicapped by their incapability of reversal which is a very serious defect in certain applications, as the propulsion of vessels, necessitating the employment of auxiliary turbines which detracts from the propulsive power and adds materially to the cost of production and maintenance of the equipment. The Tesla Turbine has the unique

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property of being reversible, not only this but it operates with the same efficiency in either direction. For marine purposes it therefore constitutes an ideal motor whether used alone or in conjunction with older types.

Besides the above it possesses other desirable features, constructive and operative, which will add to its value and adaptability to many industrial and commercial uses as, railroading, marine navigation, aerial propulsion, generation of electricity, refrigeration, operation of trucks and automobiles, hydraulic gearing, agriculture, irrigation, mining and similar purposes.

C. B. Richards, Professor Emeritus of Mechanics, Yale University:
"I am amazed at the development of power given by the turbine and stunned by the exhibit."

F. Sargent, Chief Engineer and Turbine Expert: "I am impressed with the newness and novelty of the underlying principle of this invention. It is such as will claim the attention and admiration of anyone of a scientific turn of mind in a mechanical direction."

Reynold Janney, Chief Engineer, Universal Transmission Co: "It is a great invention."

Brigadier Allen of the War Department: "Something new in the Officers are greatly impressed with it."

Miller Reese Hutchinson, Chief Engineer: "It is the greatest thing of the age."

Arnold Irinyi, Chief Engineer, Colfeurung-Gesellschaft, Cerna: "The ideal of the turbine engine."

B. R. T. Collins (Power Plant Economist): "It is a wonderful contribution to science and engineering, great in its simplicity and breadth of application."

The Motor World: "The new principle unquestionably is a great contribution to science and engineering, great in its simplicity and breadth of application."

Scientific American: "Considered from the mechanical standpoint the turbine is astonishingly simple and economical in construction, should prove to possess such a simplicity and freedom from wear and breakdown as to place it, in these respects, in advance of any type of steam or gas motor of the present day."

Engineering Magazine: "An entirely new form of prime mover with interesting possibilities."

Technical World Magazine: "The Tesla turbine is the apotheosis of simplicity. It is so violently opposed to all precedent that it seems unbelievable."

From Numerous Articles and Comments:

"The turbine is different in principle to any heretofore in use and one which will take less room, less coal than the best engine now running".....
"Turbine of revolutionary design"..... "Improvement in dynamics which promises revolutionary results"
"Results seem revolutionary to the point of staggering the imagination"..... "This motor will revolutionize the turbine industry"..... "Wonderful motor"
"Extraordinary mechanical principle"..... etc. etc



LUNCHEON

in honor of their Excellencies

CONSTANTIN M. FOTITCH
Ambassador of Yugoslavia

VLADIMIR HURBAN
Ambassador of Czechoslovakia

tendered by

DR. NIKOLA TESLA

on the occasion of his

EIGHTY-FIRST BIRTHDAY



HOTEL NEW YORKER, NEW YORK
SATURDAY JULY 10, 1937

Alaska
MSB 481



Hides - 1900

Menu



Amontillado Glace

MELON MIEL ROSÉ



ESSENCE JULIENNE AU TOMATE GELÉE

Liebfraumilch



TRUITE DE RIVIERE AUX FINES HERBES
AVEC BROCCOLI EN BRANCHE

Chateau Pontecanet



CANARD EN CASSEROLE A LA TESLA

Cognac Martell

Cordon Bleu



GATEAU SOUVENIR
AVEC FRAISES GENIEVREES
CHATEAU d'YQUEM

Mount Vernon — 1921

Haig & Haig



MOCHA EN DEMI-TASSE

Cigars
Cigarettes

1931-481

Amontillado Glace

Liebfraumilch

Chateau Pontcanet

Cognac Martell
Cordon Bleu

Mount Vernon — 1921
Haig & Haig

Cigars
Cigarettes

1901-1902

FOR ACCOMPANIMENT.

Nikola Tesla's world fame is based on the inventions which he made during the last ten years of the past century. They lie in the electrotechnical field, especially in the field of low and high frequency alternating currents, and they are the result of extremely fruitful research work. Since that time there has been developed a mighty and many-sided alternating current industry which is still growing to-day, but Tesla's name is mentioned ever more rarely in connection with this industry, although it is not unknown that he had an eminent part in laying the foundations of the electrical industry.

In this book his countryman, S. Boksan, has collected an abundance of original material about Tesla's life work and discussed it historically and critically in its bearing on the complete development of the electrical industry, so that the book offers a welcome opportunity to gain an inspiring insight into the creative labors of a genius and pioneer of the electrical industry.

Not rarely has the question been raised why, in the modern commercial exploitation of electricity, Tesla does not take the part which might be expected in view of the undimmed greatness of his inventions. Technical men, according to their specialt judge differently the disappointments which have not been spared to Tesla. For me it lies near to point out, with respect to the field of wireless telegraphy, the manifold variations which our views have undergone in the course of time. The conception of the Hertzian waves has already changed, and that in a sense which

has not been favorable to the appreciation of Tesla's merit in wireless telegraphy.

Originally only such waves as Hertz himself had employed were called Hertzian waves, that is, waves of about one meter in length. The long waves of wireless telegraphy differ from them in many respects. They do not propagate in such straight lines as true Hertzian waves and also do not spread out in free space, but at the surface of the earth. If the description of wireless transmission of energy by means of Hertzian waves is possible was therefore in the first instance at least problematical; and it is probable that Tesla would not have been at all understood, if in the nineties he had explained his results by Hertzian waves.

It was only about the turn of the century that Max Abraham succeeded in proving that the waves emitted by a grounded transmitting conductor, excited by high frequency currents, can be calculated by the same equations as real Hertzian waves; only two limitations were to be made in this connection: first, the earth must not show any electrical resistance and, second, it must be smooth. Although these conditions are in reality only partly fulfilled, the waves of wireless telegraphy have since that time been identified with Hertzian waves; yes, the wireless waves are occasionally even confounded with light waves.

Marcini worked originally with the short Hertzian waves emitted by a Righi Oscillator. When he turned to the use of long waves, in accordance with Tesla's precedent, he could without hesitation describe his propagation processes as Hertzian waves, and only thereby had the correct raiment for

wireless telegraphy been found.

The description of Tesla's work contained in this volume might give numerous suggestions to everybody who looks beyond the far reaching every-day work of the electrical industry and has in view its general progress, and may it thereby serve not only for historical ~~enrichment~~ justice, but also for the further development of the electrical industry!

Berlin-Steglitz, March 5, 1932.

Franz Kiebitz.

P R E F A C E .

The last forty years in the field of electrical engineering have been given their imprint by the polyphase current system, polyphase power transmission and the induction motor. Countless long distance central stations have been erected during this time in the entire world, many millions of horsepower have up to now been developed from water-power, and the development in this direction is gaining ever more in immensity. The transmission of electrical energy to great distances has in a short time become a mighty factor in the economics of electricity as well as in modern engineering and present-day civilization. The foundation for this development was laid in the year 1882, a round fifty years ago, by Nikola Tesla, through his discovery of the rotating magnetic field. Based on this epochal discovery Tesla himself, by intense research work lasting for ten years, made numerous detail inventions and discoveries which, together with his discoveries in the field of high tension technique, were disclosed in more than forty patents and have created the foundation for the great edifice of the present heavy current industry.

Following up this work, Tesla developed in 1890 his high frequency generators, and in 1891 his high frequency transformers, from which he has created in the succeeding years the foundations for high frequency technique and high frequency investigation. His celebrated address in Columbia College before the American Institute of Electrical Engineers on May 20, 1891 was accompanied by scientific experiments

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duly authorized Attorney upon surrender of this Certificate properly endorsed.

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this 27th day of April 1905

Langdon Greenwood

Treasurer.

The Engraving Co., 40 Beaver St., N.Y.

Wm Andrews

President.



My dear Dr. Schorff,

January 17, 1930

The most important discoveries in the
field of celestial mechanics will you frequently find;
these discoveries, which I intend to announce soon,

1) The velocity which a planet rotating around
another would attain in falling towards the
latter to its present position from infinity
is equal to its orbital velocity multiplied
with $\sqrt{2}$.

2) The kinetic energy of orbital motion of
a planet rotating around another
is equal to half of that represented by energy
the planet would have on the sphere of attraction
of the other.

When the planet may differ
from the other as much as

The kinetic energy of the planet
is equal to the kinetic energy of the other

Please preserve this

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New York, Apr. 19th, 1906.

Mr. Nicholas Tesla,
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We have your favor of the 16th inst., which confirms telephone instructions to ship to you 2600 ft. of #8 B&SG. rubber insulated and lead covered cable.

Please note we are giving this order best attention in accordance with our quotation of April 16th.

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GENERAL MANAGER, EASTERN
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Tesla doing? We find him feeding pigeons. It is a comforting sight. We make a face at Mr. Wells and we turn our back.

most reckless, mis-

NE

CS

While We Cut Relie the Budget

What good are social-help people of sixty-five a job if he's over forty? Vincent Lombardo asked letter appearing in a Passa A day later Mrs. Lombard band missing. Two days later Lombard in the Passaic River.

only answer: "Ja, we like a To which obedient and help ordered to promote is fish."

tion's members according to the food market, but the only food may be offered will be notified former, save food and avoid waste. Breesen, to make selection easy will be strictly limited, in of "The number of dishes that serving food."

providing for simplified menu card hotel organization, announced for "Ritz Breesen, head of the Berlin—

Wireless to the New York Rebuilding the Re

unintelligible.

Air Commerce Bureau's radio (2) Static conditions which did not permit a safe return. "particularly when the area Merrill flight into predicted (1) Improper dispatching lost because of:

How big-hearted of the Bureau, which admits that ing "without first definite to "forgive" Merrill for the Now the Air Commerce and one passenger were crash. Merrill, two o Only his adroit h to make a blind la In a heavy fog he transport airplane

Mr. Nikola Tesla and Mr. H. G. Wells

We are greatly reassured about life and living by the week-end story concerning the famous inventor, Mr. Nikola Tesla, the messenger boy and the pigeons in front of the Library. The tale comes like a benediction in a brittle, mechanical world: Mr. Tesla, eighty years old, full of accomplishments and honors, lives the telegraph messenger to scatter corn to the birds twice daily.

Mr. Tesla used to do the job himself. But he found it more convenient last winter to deputize the boy. Busy as Mr. Tesla is, he could not forget the ragged wild life of the metropolis and so, day after day, the hand goes out with food, the birds eat and coo and grow fat.

There is a special reason why we find reassurance in the story. For a generation we have been harrowed by tales of what the future is going to be like, when science has conquered all and when every human problem is compensated by its particular gadget. Mr. H. G. Wells has been the chief dispenser of these horror stories, giving us pictures of large-domed scientific living in atomium towers, stirring the masses from time to time to touch a button or turn a knob, so that the rationalized, electrified, mechanized, automatized world below them will proceed on schedule.

Surely Mr. Tesla, with his Tesla coil, his Tesla tube, his great achievements in transmiss- sion of electricity, is such a scientist, such a man of the future. And what do we find Mr.

Parliaments or to take part in their politics. bade either clergy (or lawyers) to sit in their provinces. The people who gave Catholicism separate from time immemorial in the Basque Second, Church and state have been kept of democracy is a wide distribution of property. almost unknown. And the securest safeguard four or five acres each and landless farmers are at all. In the Basque country the farms are per cent of the farm population owned no land owners held more than half the land and 40 democratic outlook. In Spain the great land- ism and of its piety, as of its profoundly condition lies the secret of its con- country. In its government and

(from type style)

NEW YORK Herald-Tribune?

1936-1937

Tesla

ALTHOUGH the future to Mr. Einstein and others who open time, may be as clear as pi (the mathematical kind), it is to the rest of us, who are still on standard time, as foggy as a London alley. But it is certain that when the survivors of the present age of progress come to write the roster of our great, the name of Nikola Tesla will stand pretty far up on the list. Tesla who predicted radio way back in 1900 now looks forward to sending waves to the moon. Tesla is the sort of scientist that Hollywood and Mr. H. G. Wells love, a mysterious brilliant man who has left our small reality for fourth-dimensional play in gloomy testtube-festooned laboratories. Forty years ago Tesla was toying with electrical discharges of many millions of volts, while today scientists have difficulty in developing a fraction of those potentials for their atom-smashing and X-ray experiments. Long before Marconi, Tesla girdled the earth with giant electrical waves from his high-voltage generators.

Tesla plans now to send a veritable Jovian bolt to our neighbor the moon, a beam capable of producing a large incandescent blemish on that pleasant night-time body. This bolt will carry energy waves capable of running machinery (lunar factory sites are going fast, so you'd better hurry). Although Tesla's new mechanism is a secret, it seems—from a little hint here and there—that the basic energy will be supplied by cosmic waves. Now!—if you haven't a shuddery plot doped out for a super-colossal piece featuring Boris Karloff, there's no use telling you any more.

—J. Wentworth Tilden.

Electric Sorcerer

PRODIGAL GENIUS: The Life of Nikola Tesla. By John O'Neill. 326 pp. New York: Ives Washburn. \$3.75.

By WALDEMAR KAEMPFERT

NIKOLA TESLA stalks through Mr. O'Neill's pages, the fantastic figure that he was in life—a celibate recluse who sought supreme control over matter and energy, a Dr. Faustus who cared nothing for Marguerites, a philosopher filled with a vast discontent, a poet who toyed with artificial lightning. Though he was not of this world he was something of a bon vivant in his younger days. No one could order a dinner with nicer discrimination, no one had a finer taste in rare vintages. French, English, German, Italian and his native Serbian—he not only spoke them all but quoted their poetry to all who would listen. He lived in hotel rooms most of his life, a hermit in a metropolis, whose tall, lean figure could be seen on Fifth Avenue, sunk in his thoughts, unaware of the salutations of those who knew him, stopping only to feed the pigeons around the Public Library.

To Edison must go credit for having first built central stations, inventing electric lamps and putting us on our electrical feet. Yet not much of Edison's apparatus is left. What we see about us is largely Tesla's. The man was a pioneer who could make a fortune and spend it all on lavish experimenting and who died owing J. P. Morgan, John Jacob Astor, Austin Corbin and others several millions. All were so many rabbits in the intellectual clutch of this fascinating boa constrictor. Newspaper reporters, though they could not understand what he was talking about, were enthralled with his proposals to communicate with Mars and to transmit power without wires over vast distances. Tesla knew

how to get publicity, and he liked to pose as an electric sorcerer. He would discuss his projects with apparent reluctance and in the end, as if he were utterly wearied but only having exhausted the topic, would ask for another drink, talk on billiards or quote Goethe.

LIKE a medieval practitioner of black arts, Tesla was given to mystification. He was the first to talk of "death rays." Once he set up oscillations that shook buildings near his laboratory and brought the police from headquarters. What happened is not clear, for Tesla destroyed the apparatus. The tale reminds one of his contemporary, Keeley, who was largely responsible for the popularly accepted notion that a man playing a violin can shake down a skyscraper. It may be, too, that the generators of the Colorado Springs Electric Company blew out when Tesla on Pike's Peak electrified himself and glowed weirdly. Engineers will wonder why effects that brought disaster to a power house two miles away without benefit of wires did not kill Tesla, and they will doubt if discharges of high voltage but very little amperage could do so much harm. It is not that we question Tesla but that we want more evidence than he ever supplied that an engineer can understand.

Here was a romanticist who should have been born in the Middle Ages. Electrical engineers never fully understood him. His mode of reasoning, his philosophic approach, were so much obscurantism to them. Even in the one popular article that he wrote over forty years ago for the old Century Magazine he was vague as an oriental mystic.

Soon after he came to this country Tesla was associated briefly with Edison. No greater



Tesla "in the Effulgent Glory of Myriad Tongues of Electric Flames."

contrast can be imagined: Edison, as practical as an Irish foreman of a railway section gang, who affected to despise theorists and mathematicians, though he did not hesitate to employ them; the Serbian, a dreamer to whom most inventions were mere toys, his own included. No wonder the two parted.

Though he lived to be 85, Tesla crowded most of his inventive activity within twenty years. And what activity it was! Polyphase current engineering, the induction motor, the use of oil in transformers, radio, electric arcs fed by direct current in a magnetic field, gas-discharge lamps which were forerunners of Broad-

The Future of Flight

THE COMING AIR AGE. By Reginald M. Cleveland and Leslie E. Neville. New York: Whittlesey House. 359 pp. \$2.75.

By EDWARD WARNER

THERE has been a mighty flood of books on aviation in recent years—books on every aeronautical specialty from navigation to welding, including impassioned polemics on air power. Still it has been difficult to find a single volume that could be recommended to the intelligent voter who sought a comprehensive view, and not an unduly romantic or impressionistic one, of how flight might affect human behavior and the world's economy in years to come.

It is for that voter, rather than for avid youth straining for its own wings, that "The Coming Air Age" is written. The authors have chosen a little-used target; and if they have not quite hit the bullseye, they have come close. Both are well known and long respected counselors to the aircraft industry—Mr. Cleveland who was formerly aeronautical editor of THE NEW YORK TIMES, Mr. Neville as editor of Aviation Magazine.

They have been most successful where they have been most specific. The continuity of the volume is scanty, for a variety of subjects is treated; successive chapters deal with matters ranging from the economics of private flying to the possible functioning of a world police force. All lie within the province of the title of the book; and some, at least, are the best concise treatments of their subjects that are so far available to the general reader. The chapters which will arouse the quickest interest, those dealing with air transportation, are at once optimistic and sober. The technical problems are analyzed in simple terms together with the possibilities of

Only in the chapters on air-age education and on aerial policing do the authors' convictions appear to play the leading part. On education, in particular, they write as passionate advocates of a realignment of the whole educational system around aeronautical requirements, interests and incentives. "The Coming Air Age" finds in aviation a new, dominant influence—not only in physics and chemistry, to which "belongs the heavy responsibility of teaching why the basic rules of safe flying must be observed," but in English, where "the school children of the air age * * * will have new reasons [aeronautical ones] for wanting to be literate"; and in history, where "it is not going to be easy to teach them [young people] the proper historical perspective * * * when their own inclination on the matter is to date human progress from the Wright brothers—an inclination to which most of their other subjects can cater gladly."

All this may exaggerate the violence of the break with the past. A country with 30,000,000 automobiles, and millions of trained machine operatives, has not had to await the airplane to find evidence of the universal influence of new applications of physical science to technology; but such whole-hearted advocacy of such far-reaching proposals, supported by so many detailed illustrations, deserves respectful reflection even by those who will be quick to object to its underlying assumptions.

CONCERNING the use of air power in the preservation of peace, Messrs. Neville and Cleveland show a laudable readiness to go beyond the generalizations with which that subject is too often disposed of, and to come to grips with the question of how

Also in NYPL
Group of clippings

inventing electric lamps and putting us on our electrical feet. Yet not much of Edison's apparatus is left. What we see about us is largely Tesla's. The man was a pioneer who could make a fortune and spend it all on lavish experimenting and who died owing J. P. Morgan, John Jacob Astor, Austin Corbin and others several millions. All were so many rabbits in the intellectual clutch of this fascinating boar constrictor. Newspaper reporters, though they could not understand what he was talking about, were enthralled with his proposals to communicate with Mars and to transmit power without wires over vast distances. Tesla knew

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Though he lived to be 85, Tesla crowded most of his inventive activity within twenty years. And what activity it was! Polyphase current engineering, the induction motor, the use of oil in transformers, radio, electric arcs fed by direct current in a magnetic field, gas-discharge lamps which were forerunners of Broadway's neon lights, the medical application of high-frequency currents—the record speaks for itself.

AS a practiced popularizer of science, Mr. O'Neill, who is the science editor of The New York Herald Tribune, vividly and skillfully tells the story of this extraordinary personality. His interest in his subject is more than that of the ordinary biographer. He wrote poems to Tesla as a boy, and when he made his acquaintance he sat enthralled at his feet. This biography has therefore much of O'Neill in it, which is one of its chief charms.

Because of this hero-worshipping attitude O'Neill gives Tesla far more than is his due. Tesla's great contribution to electrical engineering was his invention of alternating current machinery. Though O'Neill examines the claims of those who are regarded at least as independent inventors of this same machinery, especially the claims of Prof. Galileo Ferraris, he seems to this reviewer much too enthusiastic in Tesla's behalf. Nothing is said of S. Z. Ferranti, who in his way was just as remarkable as Tesla and who

where they have been most specific. The continuity of the volume is scanty, for a variety of subjects is treated; successive chapters deal with matters ranging from the economics of private flying to the possible functioning of a world police force. All lie within the province of the title of the book; and some, at least, are the best concise treatments of their subjects that are so far available to the general reader. The chapters which will arouse the quickest interest, those dealing with air transportation, are at once optimistic and sober. The technical problems are analyzed in simple terms together with the possibilities of solution.

THOSE who let their hopes of air cargo run away with them—not so numerous now as in the vast air-cargo excitement of two years ago—are deflated by a reminder that to move all the existing railway freight traffic in the United States by air would require a volume of gasoline equal to the world's total production of petroleum products. At the same time, the prospects of radical improvement in economy, both in fuel cost and in other costs, are recognized and discussed.

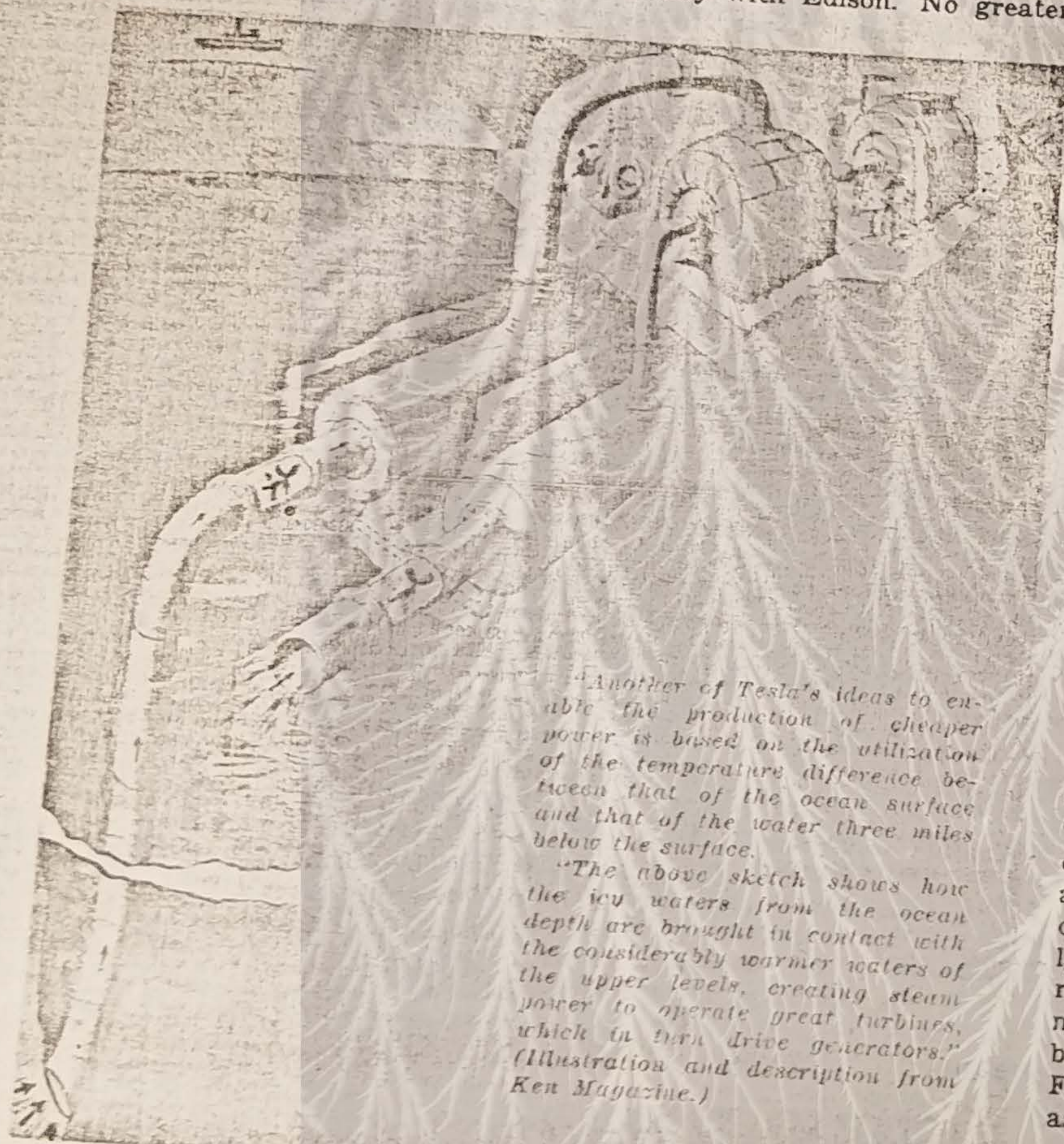
Highly successful, although somewhat more detailed than many lay readers will wish, is the chapter on air traffic control. The dependence of any large increase in air transportation upon the development of improved methods of handling the traffic without serious risk of collision is very properly emphasized. Some of the specific possibilities of improvement are described.

The general approach is descriptive, with extended quotations from various authorities.

find evidence of the universal influence of new applications of physical science to technology; but such whole-hearted advocacy of such far-reaching proposals, supported by so many detailed illustrations, deserves respectful reflection even by those who will be quick to object to its underlying assumptions.

CONCERNING the use of air power in the preservation of peace, Messrs. Neville and Cleveland show a laudable readiness to go beyond the generalizations with which that subject is too often disposed of, and to come to grips with the question of how the "police force" would actually be used to meet specific emergencies. They accept it as probable that such a force will be created; they report the astonishingly exact conclusion that "the United States will be expected to contribute * * * 20,500 aircraft valued at \$2,785,400,000"; but they are not optimistic about the outcome. Weighing the pros and cons of such an organization in the scales of a common-sense historical memory, they see as all too easy the crumbling of the framework by the withdrawal of one or another of the great powers, for reasons of economy or mutual suspicion.

The portions of the book I have described fill the last three-quarters of its pages. The opening section is devoted to geography, with emphasis on the sphericity of the earth and the possibility of drawing misleading conclusions from maps based on the Mercator projection—issues which have been so heavily exploited in recent months as to have lost some of their freshness—and to a rather general discussion of some of the political problems of international air transport.

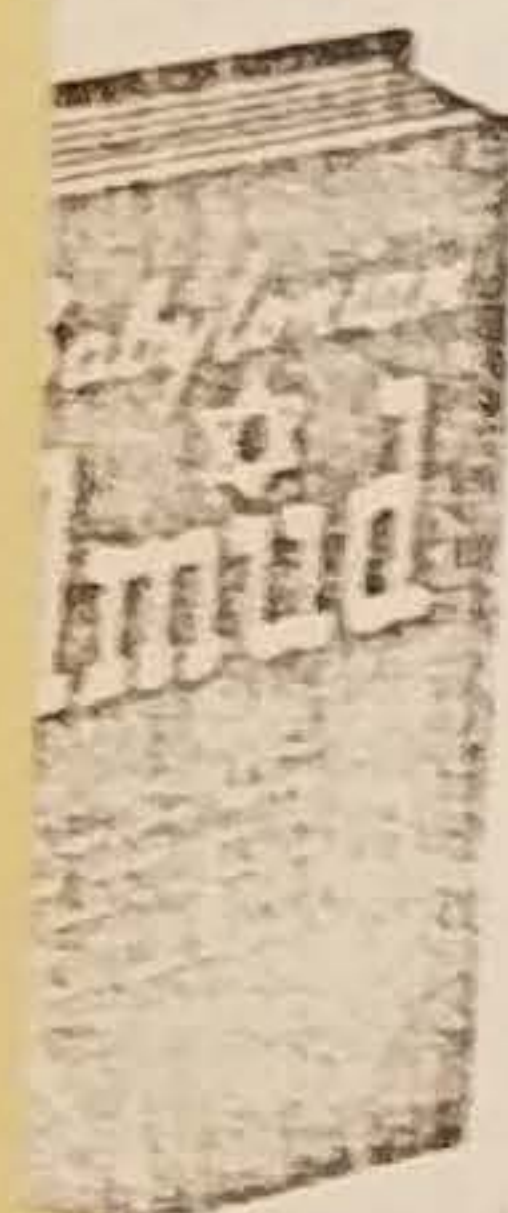


"Another of Tesla's ideas to enable the production of cheaper power is based on the utilization of the temperature difference between that of the ocean surface and that of the water three miles below the surface.

"The above sketch shows how the ice waters from the ocean depth are brought in contact with the considerably warmer waters of the upper levels, creating steam power to operate great turbines, which in turn drive generators." (Illustration and description from Ken Magazine.)

(Continued on Page 22)

THE Babylonian MUD



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AGAINST THE CURRENT. The Life
of Karl Heinzen. By Carl Wittke.
Chicago: University of Chicago
Press. 328 pp. \$3.75.

By GEORGE N. SHUSTER

AMERICA is, in part, the
handiwork of exiles. Nearly
a hundred years ago, after the
abortive revolution of 1848, the
first wave of political refugees
from Germany passed through
the formidable bottleneck of
Castle Garden. Many of them
were lovers of freedom, and some
served the major causes of the
time, particularly the Abolition-
ist movement. Perhaps the most
individualistic among them was
Karl Heinzen, for many years
editor of the vitriolic but uncom-
promisingly humanitarian Pion-
nier, memorable as one of the
landmarks of "radical" journal-
ism. Dean Wittke's biography of
this strange and able man is a
distinguished book, being scholar-
ly and objective as well as hu-
man and quite urbane.

Born in Duesseldorf while Na-
poleon was lord and master of
the Rhineland, Heinzen's mind
was fired by the ideals of the
French Revolution. He grew up
to be a most tempestuous re-
former, contemptuous on the one
hand of the religious and social
conventions to which his family
subscribed and vehemently hos-
tile on the other hand to the so-
cialistic Utopia advocated by
Marx and Lasalle. He held that
reason could solve life's problems
if only humanity gave it a
chance. The Germany he loved
must therefore clear the way for
the social application of reason
by becoming a republic of free
men. Naturally, it was often dif-
ficult to determine what "reason"
suggested in a given practical in-
stance. Heinzen quarreled with
his fellow-revolutionists of 1848,
finding for each of them an en-
dless variety of picturesque names.

tirely dedicated to lost causes and
forlorn hopes is shown by the fact
that Heinzen championed equal
rights for women and for Ne-
groes. He was, of course, also a
resolute foe of slavery. Since he
was a very well educated man,
his views on the subject of scho-
lastic training are still worth
reading, even though he was far
more Rousseauistic than Rous-
seau. His standards of morality
were exceedingly high, divorced
though they were from religious
belief and based upon a system
of thought which he termed "ma-
terialism." On the other hand,
he was the sort of radical who
vehemently insisted upon govern-
mental action for things he be-
lieved desirable, but resisted with
equal force all encroachments
into spheres he defined as per-
sonal. Thus he advocated a
policy of punishment toward the
defeated South, but held that no
child ought to be compelled to go
to school. He demanded that the
State suppress the churches, but
advocated the public support of
temples in which the gospel ac-
cording to Heinzen should be
preached. Other immigrant
groups he was likely to refer to
with scornful contempt, while
holding that the right sort of
German was a precious Ameri-
can asset.

Possibly it is Heinzen's atti-
tude toward his native Germany
which is now of the greatest in-
terest. Until well past 1870 he
hoped that the republic of which
he had dreamed would be erected
and would embrace all the Ger-
man lands, including Austria. But
when his erstwhile countrymen
turned stuffy braggarts after the
defeat of France in 1870 and

docilely placed the Hohenzollerns
on the imperial throne, he fought
back with pamphlets, some of
which advocated tyrannicide.
Slowly he was compelled to admit
that what he had hoped for
would never come to pass. He
wrote that German chauvinism
was more detestable than the
French variety, "because it is fed
by servility and insolence." Though his language was usually
bizarre and extreme, much that
he had to say was prophetic.

Dean Wittke says quite mod-
estly that Heinzen deserves a
biography if only because he is
the evidence that "once there was
a strong, liberal, cosmopolitan
group in the German states which

is the absolute antithesis of pres-
ent-day nazism." The reader will
agree that the debt has here been
paid in worthy fashion. Yet the
suspicion will not vanish that one
reason why the "liberal, cosmo-
politan" German group did not
succeed must be found in its tur-
bulent, cantankerous individual-
ism—a trait which was, alas!
quite as marked in the era imme-
diately preceding Hitler as it was,
apparently, in 1848. Heinzen's
Communist friends referred to
him as a "bourgeois democrat." He
retaliated in kind. Just that
sort of debate was in progress
prior to 1932, and one can only
suppose that it will be resumed
anew as soon as peace returns.

Nikola Tesla, Electric Sorcerer

(Continued from Page 6)

certainly built in London the first
commercial alternating current
station.

O'Neill believes so devoutly in
Tesla that he regards him as the
father of electrotherapeutics,
though D'Arsonval deserves fully
as much if not more credit for
the use of high-frequency cur-
rents in medical practice. There
is no doubt about Tesla's origi-
nality or about the grand way in
which he thought and acted, but
the phenomenon of simultaneous
and independent invention is so
well known that no physicist,
however accomplished, ever
stands alone.

Despite his extraordinary im-
agination, his profound knowl-
edge of science and his rare gifts,
Tesla remained a Victorian. When
the atomic physicist gave us the
electronic theory of matter and
Einstein relativity Tesla would

have none of them. He wanted
his infinite universe, his Euclid-
ean space, an ether which had
become preposterous even when
he was still in his prime. He
died, lonely and misunderstood,
leaving much of immense, prac-
tical importance but far more
which is no clearer to us than the
boasts of Paracelsus or the mys-
tical forebodings of a Nostrada-
mus.

O'Neill's book is the one full-
length biography and the one ap-
preciation of Tesla that we have.
An immense amount of work has
gone into its production. It does
honor both to Tesla and its au-
thor, and it ought to be read by
anyone who takes the slightest
interest in this highly electrified
world of ours. As for those nov-
elists who still believe that a
scientist is a wizard of the Mer-
lin type, they will find O'Neill's
Tesla made to order.

CS

2,000 ARE PRESENT AT TESLA FUNERAL

Cathedral of St. John the Divine
Is Scene of Yugoslav State
Function for Scientist

GREAT IN SCIENCE ATTEND

Ambassador Fotitch Heads the
Procession of Mourners—
Bishop Manning Assists

Inventors, Nobel Prize winners, leaders in the electrical arts, high officials of the Yugoslav Government and of New York, and men and women who attained distinction in many other fields paid tribute yesterday to Nikola Tesla, father of radio and of modern electrical generation and transmission systems, at an impressive funeral service in the Cathedral of St. John the Divine.

The service, conducted in Serbian by prominent priests of the Serbian Orthodox Church, was opened and closed by Bishop William T. Manning, assisted by Father Edward West, Sacrist of the Cathedral. The Serbian Orthodox Office for the Dead was said by the Very Rev. Dushan Shoukletovich, rector of the Serb Orthodox Church of St. Sava, who officiated in the name of the Serbian Orthodox Church in America.

City Is Represented

More than 2,000 persons attended the service. The city was represented by Newbold Morris, President of the City Council, who headed the list of honorary pallbearers. Other honorary pallbearers included Dr. Ernest F. W. Alexanderson of the General Electric Company, inventor of the Alexanderson alternator; Professor Edwin H. Armstrong of Columbia University, inventor of frequency modulation and many other important radio devices; Dr. Harvey C. Rentschler, director of the research laboratories, Westinghouse Electric and Manufacturing Company; Gano Dunn, president of the J. G. White Engineering Corporation; Colonel Henry Breckenridge, Dr. Branko Cubrilovich, Yugoslav Minister of Agriculture and Supply; Consul General D. M. Stanoyevitch of Yugoslavia and Professor William H. Barton, curator, Hayden Planetarium.

Fotitch Heads Procession

The funeral service was held as an official State function of the Yugoslav Government, which was officially represented by Constan-

tine Fotitch, Yugoslav Ambassador to the United States. Dr. Fotitch led the procession of mourners who passed the coffin before it was closed. Oscar Gavrilovitch, Yugoslav consul in New York, headed the list of ushers.

Many telegrams were received from officials of the United States Government, prominent scientists, literary men and many others. These included messages from Mrs. Roosevelt, on behalf of herself and the President; Vice President Henry A. Wallace, Professors Robert A. Millikan, Arthur H. Compton and James Franck, all Nobel Prize winners in physics; Professor William Lyon Phelps of Yale, Jean Piccard and Major Gen. J. O. Mauborgne, U.S.A., retired.

Mrs. Roosevelt's message read: "The President and I are deeply sorry to hear of the death of Mr. Nikola Tesla. We are grateful for his contribution to science and industry and to this country."

Vice President Wallace's message read as follows:

"Nikola Tesla, Yugoslav born, so lived his life as to make it an outstanding sample of that power which makes the United States not merely an English-speaking nation but a nation with universal appeal. In Nikola Tesla's death the common man loses one of his best friends."

Scientists Pay Tribute

Drs. Millikan, Compton and Franck paid tribute to Tesla as one of the world's outstanding intellects, who paved the way for many of the important technological developments in modern times.

Among the many floral offerings was a wreath from King Peter II of Yugoslavia; the Royal Yugoslav Government, Ambassador Fotitch and many Yugoslav societies.

Chief mourner was Sava Kosanovich, nephew of Dr. Tesla and president of the Eastern and Central European Planning Board, representing Yugoslavia, Czechoslovakia, Poland and Greece.

The body was taken to Ferncliffe Cemetery, Ardsley, N. Y., where it will be in the receiving vault until plans are completed.

CAPT. EDWARD B. WINN

SAN JUAN, Puerto Rico, Jan. 12 (AP)—Captain Edward B. Winn, United States Army Finance Officer at the San Juan departmental headquarters, died yesterday at the age of 52.

Other obituaries on preceding page.

French

NEW CLASSES TODAY

FRENCH — Wednesday, 6 to 8 p. m.
SPANISH — Wednesday, 7 to 9 p. m.
ITALIAN — Wed. & Fri., 8 p. m.

BERLITZ 630 Fifth Ave. Cl. 6-1416
SCHOOL OF LANGUAGES

Rockefeller Center (at 50th St.)
Same classes in Brooklyn, 66 Court St.

EDGAR PALMER

NIKOLA TESLA RITES TO BE HELD TUESDAY

Yugoslav Government-in-Exile Plans Official State Funeral

Nikola Tesla, father of radio and of the modern electrical transmission systems, who died Thursday night at the Hotel New Yorker at the age of 86, will receive an official state funeral under the auspices of the Yugoslav Government-in-Exile, it was announced last night by the Yugoslav Information Center.

The service will be held in the Cathedral of St. John the Divine on Tuesday at 4 P. M. Meanwhile the body will lie in state at the Campbell Funeral Church, Madison Avenue and Eighty-first Street.

Yugoslavia, where Dr. Tesla was born of Serbian parents, will be officially represented by Ambassador Constantin Fotitch and many present and former high officials of that country. Among them will be Dr. Ivan Shubashich, Governor of Croatia; Dr. Bogoljub Jevtich, former Prime Minister of Yugoslavia; Branko Chubrilovich, Yugoslav Minister of Food Supply and Reconstruction; Franc Snoj, Minister of State representing the Slovenes, and Dr. Tesla's nephew, Sava Kosanovitch, president of the Eastern and Central European Planning Board, representing the Yugoslav, Czechoslovak, Polish and Greek Governments.

Held Patents on Transformers

Dr. Tesla, who held more than 700 basic patents, is regarded as the man who laid the foundations for modern radio broadcasting and television; for the giant electrical transformers and other transmission apparatus, and for the basic apparatus that makes possible neon lights and fluorescent illumination.

To the end of his days Dr. Tesla claimed that the Marconi system of wireless telegraphy was an infringement on his method and apparatus for transmitting energy without wires. Dr. Tesla brought suit against Marconi in an effort to gain legal recognition of his claim. He blamed his failure to establish his patent rights to the paucity of technical knowledge at that time on the difference between microwaves and short waves. When the distinction finally became clear the original Tesla patents had run out.

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Nikola Tesla Dies At 85 Alone in His Hotel Suite

**Celebrated Inventor,
Born in Yugoslavia,
An Electrical Wizard**

Nikola Tesla, 85, inventor of the Tesla coil, the induction motor and hundreds of other electrical devices, died last night in his suite at the Hotel New Yorker. According to hotel officials, he had been in failing health for two years.

The world-famous inventor, who died alone, was found dead in bed by a maid. She called a hotel physician.

The hotel management started a search for friends or relatives. It was believed a nephew is living in the city but his whereabouts are not known.

Nikola Tesla was born in Smiljan, Yugoslavia, in July, 1859. His father, a Greek Orthodox Church minister, was a noted writer, orator, linguist and mathematician. His mother, Georgina Mandic, was an inventor.

Came Here in 1894.

Tesla studied at Gratz Polytechnic Institute and the University of Prague after preparatory work at the Realschules of Lika and Carlsbad. He came to the United States in 1894, and became a naturalized citizen.

In 1886 he designed the arc-lighting system. Two years later he invented the Tesla motor and designed a plan for the transmission of alternating current. The following year he presented plans for electrical conversion and distribution by oscillatory discharges.

His high frequency studies and development of the transforming coil bearing his name occurred from 1890 to 1891. From then up to 1900 his discoveries and inventions included such fields and appliances as wireless communication, electrical oscillation, radiant power and radioactive matter.

Communications and wireless power transmission occupied most of his research after that. He worked at the laboratories of Thomas Edison at Orange, N. J., specializing in motor design.

Fed Crumbs to Pigeons.

During recent years Mr. Tesla had been seen, but seldom recognized, on the steps of St. Patrick's Cathedral, in front of the Public Library and in Greeley Sq., invariably carrying a bag of crumbs which he fed to the pigeons.

Mr. Tesla's only military invention was a method to which he once alluded but never fully described. It was a means whereby an impenetrable "wall of force" could be erected about a nation's borders which would render helpless any military attack. He disclosed existence of the plan in 1934, and said he intended to present it to the Geneva Conference. He seldom referred to it afterward.

In 1936, when he was 80, he said his original plan to live to be 135 had been changed with the repeal of prohibition, and he would live to be 150 instead.

He was decorated by the Yugoslav and Czech governments. He wept when he met King Peter of Yugoslavia here last July.

des - 1900

JAN. 8, 1943

NIKOLA TESLA, 86, PROLIFIC INVENTOR

Alternating Power Current's Discoverer Dies in His Hotel Suite Here

HIS 'DEATH BEAM' CLAIM

He Insisted the Invention Could Annihilate an Army of 1,000,000 at Once

Nikola Tesla, electrical inventor, died last night in his suite at the Hotel New Yorker.

According to the hotel staff, the electrical engineer and designer, who was 86 years old, had been in failing health for two years. Of vigorous temperament and with emphatic ideas on personal health as well as engineering, he had few visitors, according to the hotel management, which reported that his meals, strictly vegetarian-style, were especially prepared for him by the chef.

"He made everybody keep at a distance greater than three feet," a hotel executive recalled.

A spokesman for the hotel said that Dr. Tesla died as he had spent the last years of his life—alone. He was found dead in bed by a floor maid at 10:45 P. M. She called a house physician, who pronounced him dead.

The New Yorker management was attempting last night to locate friends of the inventor. It was believed he had a nephew living in this city.

Ideas Fantastic Toward End

Nikola Tesla's ideas bordered increasingly on the fantastic as he advanced in years. On his seventy-eighth birthday he announced in an interview that he had invented a "death beam" powerful enough to destroy 10,000 airplanes at a distance of 250 miles and annihilate an army of 1,000,000 soldiers instantaneously.

In his seventy-seventh birthday interview he had no specific invention, but said he expected to live "beyond 140." The year before, however, he spoke of two great impending discoveries.

"When they are announced," he said, "one will be like the 100,000 trumpets of the Apocalypse. The other will be less sensational, but it, too, will be important. It will be like the shout with which Joshua's army brought down the walls of Jericho."

Since he made his first practical invention—a telephone repeater—in 1881, while living in Budapest, Mr. Tesla claimed to have made about 700. Many of them were of great importance, but these were nearly all invented in the last twenty years of the past century.

Not Practical in Business

He was greatly handicapped by lack of funds, for he was anything but a practical man as far as business was concerned. It was said that he was frequently victimized, but he did not seem to worry much as long as he had a place to work.

Tesla probably could have become a rich man had he chosen to become an employee of a large industrial concern, but he preferred poverty and freedom. Early in 1887 he had formed the Tesla Electric Company of New York, but the concern was not a financial success. For many years he did not even have a laboratory to work in, conducting his experiments in hotel rooms.

Of his inventions the most important were his systems of alternating current power transmission



NIKOLA TESLA
The New York Times, 1936

charges was devised the following year, and in 1891 the now famous Tesla coil, or transformer, was invented.

Mr. Tesla devised a system of wireless transmission of intelligence in 1893, and this was followed by mechanical oscillators and generators of electrical oscillations.

From 1896 to 1898 Tesla made researches and discoveries in radio waves, material streams and emanations.

Mr. Tesla received the Elliot Cresson gold medal in 1893 in recognition of his original work first presented before the Franklin Institute and the National Electric Light Association.

In November, 1931, he published designs of two power plants, one to utilize the heat below the surface of the earth, the other to take advantage of the difference between the upper and lower levels of the ocean.

Preferred Shop to Society

Shy of manner and ascetic in tastes, Mr. Tesla preferred workshop to society. He never married. He ate sparingly, drank neither coffee nor tea because he considered those beverages to be highly injurious. On the other hand, he regarded alcohol moderation as virtually an elixir of life. It was his habit to stay until daylight and then sleep for a few hours before resuming his work.

At one time Tesla had the financial backing of J. Pierpont Morgan the elder. He built a tall tower on Long Island to get wireless power, but when his employer died no more money was coming and the plan had to be abandoned.

Mr. Tesla once owned a bungalow on Houston Street, New York, but it burned down and he had another.

CAPTAIN A. C. KROE

Ex-Officer of Netherlands —Was Released by Japan

MELE, Australia, Jan. 7 (Netherlands News Agency).—Captain A. C. Kroef, former modore of the P. M. Royal Netherlands Steam Packet Company, Eastern shipping line, who turned to Melbourne recently, his release from a Japanese internment camp, died yesterday heart attack.

Captain Kroef first knew if state of war existed between Japan and the Netherlands when his was seized and he and his fellow officers were jailed in Yokohama. After twenty-one days of life under "filthy conditions," he transferred to an internment camp where conditions were "somewhat better."

He served with K. P. M. thirty-three years, twenty-five of which were spent on the Singaperbangsa East Indies-Australia line. Captain Kroef was in re-

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Tesla probably could have become a rich man had he chosen to become an employe of a large industrial concern, but he preferred poverty and freedom. Early in 1887 he had formed the Tesla Electric Company of New York, but the concern was not a financial success. For many years he did not even have a laboratory to work in, conducting his experiments in hotel rooms.

Of his inventions the most important were his systems of alternating current power transmission and distribution of electrical energy. His system of electrical conversion and distribution by oscillatory discharges was highly significant, as were his researches and discoveries in radiations, material streams and emanations.

After his discovery of a system of transmission of power without wires and a high-potential magnifying transmitter. Tesla had been chiefly engaged—since 1903—in the development of a system of telegraphy and telephony, and designing a plant for the transmission of power without wires, to be erected at Niagara.

As early as 1908 Tesla made it known that he was experimenting with interplanetary communication. He firmly believed that most of the planets are inhabited and that messages could be sent between the earth and Mars, Jupiter, Venus, &c.

He also had visions of harnessing the sun's rays and of utilizing the energy of the sea.

Son of Greek Clergyman.

Nikola Tesla was born at Smiljan, Lika, a border country of Austria-Hungary, on July 10, 1856. His father was a Greek clergyman and orator, and his mother, Georgina Mandic, was an inventor.

His education began with one year in elementary school and then four years of the lower Realschule at Gospie, Lika. Then he went to a higher school at Carlstadt, Croatia, being graduated in 1873. He studied for four years at the Polytechnic School at Gratz, devoting most of his time to mathematics, physics and mechanics, and then had two years at the University of Prague, where he studied philosophy.

In 1881 he went to Paris, where he worked as an electrical engineer, and the following year he went to Strassbourg, where he installed a mechanical plant. He was attracted to America by the remarkable progress in electrical energy, and came to this country in 1884.

For some time he worked with Thomas A. Edison at Orange, N. J., chiefly designing motors and generators. In a short while a proposal was made to him to start his own company. He accepted the terms and began by working up a practical system of arc lighting, as well as a potential method of dynamo regulation, which became known as the "third-brush regulation."

Invented Coil in 1891.

He also devised a thermomagnetic motor and other kindred devices. Soon after the Tesla Electric Company had been formed Mr. Tesla produced his epoch-making motors for alternating current, in which, going back to earlier ideas, he evolved machines having neither commutator nor brushes. This important invention came in 1888. His system of electrical conversion and distribution by oscillatory dis-

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He served with K. P. M. thirty-three years, twenty-five which were spent on the Singaperbangsa Netherlands East Indies-Australia run. Captain Kroef was in retirement in Sydney when the European war broke out, and re-entered maritime service after the invasion of the Netherlands in 1940. His son, Jan, is serving with the Netherlands Navy.

MOHAMMED HASSAN

Persian Prince of Former R House Dies in Exile at 4

Special Cable to THE NEW YORK TIMES LONDON, Jan. 8.—Prince Mohammed Hassan of Persia, brother of the former Shah, Sultan Ali, and member of the Kadjar dynasty, collapsed in the street at Madrid today, dying while taken to a hospital. His age was 40.

The Prince, who proclaimed himself right to the throne in 1930, had been in Persia after the Riza Khan revolution of 1925, and had lived in England since. Surviving are two sons, one of whom is in the British army.

Sultan Ahmed, the last of the Kadjar dynasty, which had ruled Persia since 1795, died in exile in Paris in 1930, after five years of imprisonment. He had been an ex-prisoner of the revolution in 1905. Riza Khan seized the throne.

ERNEST J. HOWE

Special to THE NEW YORK TIMES Poughkeepsie, N. Y., Jan. 7.—Ernest J. Howe, an assistant civil engineer of the New York State Department of Public Works, assigned to the Poughkeepsie office, died today in the Veterans' Brothers Hospital here at the age of 66.

Mr. Howe, who was born in Canton, Mass., and was graduated from the University of Maine, was a former chief engineer of the Taconic State Park Commission. He entered the employ of the New York State Department of Public Works in 1906.

He leaves a widow, Mrs. Amy Howe.

SAMUEL W. TILDEN

MONTREAL, Jan. 7 (Canadian Press)—Samuel W. Tilden, who formerly was well known as a amateur boxer and basketball player in the United States and Montreal and was manager here for an Ottawa printing and lithographing firm, died yesterday at his home in neighboring Westmount at the age of 70. He was born in Worcester, Mass., and came to Montreal in 1903 as manager of Mortimer Ltd., Ottawa printers. He leaves a widow.

the Spirit.—Ephesians, V., 18.

gested by Rev. J. A. Villelli, pastor of Sea and Land Presbyterian Church, Manhattan.)

HUMAN SIDE OF THE NEWS

By Edwin C. Hill

A Magician in Science.

TO the moon with America's greatest living inventor, Nikola Tesla! Well, not precisely—though if Father Time were to grant Mr. Tesla another half century or so of life I, for one, wouldn't bet against the moon adventure under his eager auspices. The man has lived long and wrought greatly, and the keenest desire of his life is to live longer and materialize the dreams which haunt his scientist's imagination.

He is working now on an energy-transmitting device to project electrical waves to Lady Luna, waves of such potency and power that a tract of light as large, perhaps, as the State of Connecticut could be fixed momentarily upon the surface of the moon.

If he lives long enough he will do it, and that's a fairly safe prediction, for Dr. Tesla has accomplished many marvels in his 82 years upon this earth.

His birthday falls on July 10, and finds him in fair health for one of his years.

It was 40 years ago, B. M., Before Marconi, that Nikola Tesla predicted the coming of radio communication and sent electrical waves racing around the globe from high voltage generators.

Another dream of this truly great scientist is to perfect what we laymen might call a "magic ray" which would protect ships from the mariner's greatest peril, fog, and bring them unfailingly to port. It might indeed—so far does his dream range out over the troubled field of human life—put an end to war. A magic ray so terrible, so powerful that raiding airplanes could not last one second above their designed victim of a city.

Mr. Tesla lives and dreams and works at a New York hotel and there, usually, you may find him upon any proper business—amiable, charm-



EDWIN C. HILL

ingly conversational, intensely interesting with his glimpses of new marvels and promises of a new world. He is the only American inventor with 750 basic patents to his credit—the only inventor who ever lived, so far as this writer knows, who ever explored so many fields with patented results to prove his roving and wanderings. Half the civilized nations of the world have honored him with orders and medals.

Nikola Tesla is an Austrian. He was only 28 years old when he came from the University of Prague to enter the laboratory of the great Edison. That was the beginning of an amazing career. For more than 50 years he has been a man of magic. Full-fledged from his amazing brain have come marvel after marvel. He gave us the induction motor which made possible alternating electric current. He gave us innumerable indispensable electrical appliances. His imaginative mentality reaches out into the hereafter itself. He wonders if life cannot be recalled—as to whether a man electrocuted in the death chair could be restored to life by the application of an electrical current. He really thinks it could be done.

It was 30 years ago, on Pike's Peak, that he is sure he plucked from the air at that 14,000 foot height signals from the planet Mars. Mr. Tesla believes, as the late Prof. Lawrence Lowell believed, that there are living, humanlike creatures on our nearest neighbor in the family of planets, and much more intelligently advanced than we are. He thinks that they have been trying for many centuries to reach our dull intelligences.

Now, at 82, Nikola Tesla is working not only on an apparatus to prove unfailing communication, to insure safety of ships, to locate hidden treasure and to determine the earth's physical constants, but also on a means to end war. Mr. Tesla is reaching into the infinite to snatch a bolt of lightning for the salvation of mankind. It is to be the Tesla death beam—literally a lightning bolt. It will have such a terrific energy that a thousand invading airplanes could be sent earthward in flaming fragments within ten heartbeats—annihilated. Two hundred thousand men, horse, foot and artillery, crossing the border of a defeated enemy could be dropped dead in their tracks.

MARCH OF EVENTS

By Benjamin DeCasse

TESLA'S EARTHQUAKE

Mr. Weyant, Editor, Scientist's
Test in the Year 1898.

To the What Do You Think Editor:
Sir: Answering the query of
"One Who Was There" in your
issue of the twenty-second, re the
demonstration by Nikola Tesla: In
my extensive files re Houston street
I find an item of July 11, 1935,
from the Brooklyn Times Union,
entitled "Scientist Tesla Reveals
Self as Earthquake-Maker: Started
Houston Street Tremors 37 Years
Ago; Could Shake Down Whole
City." It is too long to quote, but
the date is probably what concerns
your inquirer, so, 1898 would be the
date when Tesla started the Hous-
ton street earthquake, and probably
he had occupied his laboratory for
years before that. And The New
York Sun of July 11, 1935, carried
three pictures of Tesla.

MORRISON V. R. WEYANT.

MAN'S GREATEST ACHIEVEMENT

By Nikola Tesla.

From birth its sense-organs are brought in contact with the outer
worlds of sound, heat and light, beat upon its feeble body, its sensitive
nerves, the muscles contract and relax in obedience: a gasp, a breath,
a marvelous little engine, of inconceivable delicacy and complexity
unlike any on earth, is hitched to the wheelwork of the Universe.
The little creature labors and grows, performs more and more involved operations, be-
comes sensitive to ever subtler influences and now, there manifests itself in the
fully developed being - Man - a desire mysterious, inscrutable and irresistible: to
imitate nature, to create, to work himself the wonders he perceives. Inspired to
this task he searches, discovers and invents, designs and constructs, and covers with
monuments of beauty, grandeur and awe the star of his birth. He descends into the
bowels of the globe to bring forth its hidden treasures and to unlock its immense
imprisoned energies for his use. He probes the dark depths of the ocean and the
azure regions of the sky. He peers into the innermost nooks and recesses of
molecular structure and lays bare to his gaze the worlds infinitely remote. He subdues
and puts to his service the fierce, devastating spark of Prometheus, the titanic
forces of the waterfall, the wind and the tide. He tames the thundering bolt of
Jove and annihilates time and space. He makes the great Sun itself his obedient
toiling slave. Such is his power and might that the heavens reverberate and the whole
earth trembles by the mere sound of his voice.

What has the future in store for this strange being, born of a breath, of per-
ishable tissue, yet immortal, with his powers fearful and divine? What magic will
be wrought by him in the end? What is to be his greatest deed, his crowning achieve-

TESLA HAS PLAN TO SIGNAL MARS

Scientist, 81 Years Old,
Celebrates Birthday.

DECORATED BY 2 COUNTRIES

Seeks Guzman Prize for Idea on
Planet Communication.

Nikola Tesla is 81 years old. Some reference books, including "Who's Who," fix the year of his birth at 1857. He does not know whether the anniversary should have been celebrated Friday or, as it was, on Saturday, because it was just at midnight between July 9 and July 10 that he was born. But the year was 1856.

It was a most unusual birthday party the inventor held at the Hotel New Yorker, where he makes his residence. For the Ministers of his native Yugoslavia and neighboring Czechoslovakia and their staffs, and a handful of newspaper men, Dr. Tesla had provided a most unusual material and mental feast.

Figuratively, at least, they are still smacking their lips today over the food and wines and speculating about what may come from the discoveries the scientist announced, his quest for the French Academy prize for interplanetary communication, the perfection of a tube to carry immense electrical voltages, and some of the more abstract observations regarding cosmic rays and what makes this universe of ours expand and contract, oscillating instead of always expanding as some physicists hold.

Considering his years and the fact that recently he was the victim of an automobile accident which shook his system seriously, Dr. Tesla is exceedingly vigorous. His thinning hair, although predominantly white, still has considerable black. His eyes are as keen and penetrating as ever. He speaks distinctly although, of course, was a bit of the accent he has always had. But he picked up questions quickly and answered them in a manner that showed a tremendous grasp of all the latest theories of the astronomers, physicists and other scientists.

Announces Discoveries.

In recent years Dr. Tesla has made a habit of announcing on his birthdays some of the discoveries he has made in the past year. And he feels that with the passing of the years they have increased in importance. He said: "The maximum power of man is reached in his age rather than in his prime, as many suppose. Every one should have a decade to sum up the work of his lifetimes after he reaches the age of seventy-five. By then, if he has worked constantly in one field, he has gained so much experience that the solution of problems becomes much easier."

Everything at the birthday party was designed to lead up to the discussion of the inventor's latest achievements. Although he tasted only two of the courses and refrained altogether from any drink but water, he treated his guests to the finest in foods and wines.

The piece de resistance was "Canard en casserole a la Tesla," a dish he had planned himself about ten years ago, consisting of duck roasted slowly in a casserole, smothered with whole stalks of celery. It won unstinted praise from the diplomatic representatives.

Dr. Tesla did take just a taste of this dish to make certain that it had been properly prepared and, as a sign of his approval had the chef come in to receive the applause of

He gave little glimpses of his boyhood life in Yugoslavia. One gathered he had acquired much of his genius from his learned father, a Slavonian priest, and his mother, a practical and also a brilliant woman.

When, in 1884, Dr. Tesla landed at the Battery he had just 4 cents. He had only gone a few blocks up Broadway when he saw some men sweating over an electrical machine that had broken down.

"It was a machine I had helped to design, but I did not tell them that," he said. "What is the matter?" and they said, "This thing won't work." I asked, "What would you give me if I fix it?" "Twenty dollars" was the reply. I took off my coat and went to work. I had it running perfectly in an hour and had earned \$20."

He shortly found it was not all as easy as that. There were many days when he did not know where the next meal was coming from. "But I was never afraid to work. I went to where some men were digging a ditch. I said I wanted to work. The boss looked at my good clothes and white hands and he laughed to the others. 'This man wants to work.' But he said 'All right. Spill on your hands. Get in the ditch. Go to work.' And I worked harder than anybody. At the end of that day I had \$2. And I kept it up until I had enough to get started again."

Support Bums Today.

"Could that happen today?" he was asked. There was a serious pause, a grave frown and he said, "I am afraid not. The present is destructive. The workers are expected to support the bums."

Before the birthday cake was cut Dr. Tesla was invested with the orders which Yugoslavian and Czechoslovakian ministers had brought. Dr. Constantine Fotitch, Yugoslavian Minister, who was attended by R. Petrovich, first secretary of his legation, and B. P. Stoyanovich, the Consul-General here, bestowed the grand Cordon of the White Eagle in behalf of King Peter.

Dr. Tesla sharply assailed those physicists who contend that cosmic rays originate in far places of the universe where matter is converted into energy. He produced a formula saying "The kinetic and potential energy of a body is the result of motion and determined by the product of its mass and the square of its velocity. Let the mass be reduced, the energy is diminished by the same proportion. If it be reduced to zero, the energy is likewise zero for any finite velocity."

About half of his talk was devoted to abstract scientific problems.

Turning from the more metaphysical aspects of his studies to the practical, Dr. Tesla disclosed his greatest ambition is to be the man who evolved a method of communicating with other planets. He thinks he has found the answer and is preparing to lay its formula before the Institute of France in quest of the Pierre Guzman price of 100,000 francs offered for a means of communicating with other worlds.

The man who accomplishes this, he feels, will be remembered after all present inventions are forgotten.

Streamlined Train Takes Elks to Denver

DENVER, July 12 (A. P.).—The Denver Rocket, a Rock Island streamlined train, concluded its maiden trip at 11:35 P. M. yesterday, bringing a delegation of Chicago Elks to the national convention here.

The train, an 1,800-horse power motor pulling three cars, left Chicago at 7 A. M., making the trip in 16 hours and 35 minutes.

NOVEL

N.Y. SUN

JULY 12, 1937

N.Y.
Sun
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Dr. Tesla did take just a taste of this dish to make certain that it had been properly prepared and, as a sign of his approval had the chef come in to receive the applause of his guests. The other dish of which he partook was a jellied consommé.

Alcohol, he believes, is a great thing. Whisky and wine are preferable to coffee and tea. As his guests smacked their lips over some of the vintages he had brought forth for the occasion, they were disposed to agree with Dr. Tesla on this point.

Genius From Parents

It was in the random conversation of the meal that one learned many intimate things about Dr. Tesla.

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Chicago Daily News
July 15, 1935

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Editor and Publisher

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days the commutator, which made it possible for the dynamo to deliver direct current, was not only necessary, but had become a sacred technical cow. Without it there could be no direct current from the dynamo, and science knew not how to handle the other kind.

Tesla devoted years to knocking those commutators off the generator. To do that he had to develop an entirely new technology to make alternating current useful.

Did he succeed? Look about you!

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STORIES IN STAMPS

ELECTRIC WIZARD



SOME scientists scoff at him for his amazing theories, but Nikola Tesla has so heroic a record of achievement in electrical science that the world must take him seriously. Born July 11, 1856, in what is now Yugo-Slavia, this sharp-faced, wiry bachelor of 80 holds more than 700 basic patents, among which are the coils, motors, dynamos, condensers, and electric lamps which bear his name, the arc light, and many other electrical aids.

Tesla came to the United States when a youth. Here he discovered the principle of the rotary magnetic field, and since has been working on other ideas which seem so futuristic as to cause more conservative scientists to ridicule him. Yet, while he divulges his secrets of a proposed death ray, or a mysterious source of new power, or the photography of thought, he also scoffs at Einstein's theory of relativity and the general belief that the

sun is cooling off gradually. Recently, on the occasion of Tesla's 80th birthday, Yugo-Slavia issued a set of four stamps picturing the scientist.

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Practices

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World Telegram October 2, 1935

5, 1935

Tesla Predicts Ships Powered By Shore Beam

Scoffs at Normandie 'Speed,' Sees Success for His Plan to Use Stratosphere Ray

Would Light Sea at Night

Says French Liner's System Copies His in U. S. Boats

Dr. Nikola Tesla, scientist and seer whose discoveries in the fields of polyphase electrical current and wireless place him in the front rank of modern inventors, refused yesterday to be awed by the record speed achievement of the French liner Normandie in crossing the Atlantic in 4 days 11 hours 42 minutes and predicted that enormous ships would cross the ocean at far greater speeds by means of a high-tension current projected from power plants on shore to vessels at sea through the upper reaches of the atmosphere.

In his room at the Hotel New Yorker, dressed in a blue bathrobe, blue socks and red slippers, Dr. Tesla expounded the principles of his fabulous method of power transmission—a method which he has been developing at irregular intervals from as far back as 1897. The virtues of stratosphere transmission, he said, lay not only in its potential increase of a vessel's speed but also in its power to eliminate the dangers of nocturnal navigation.

In short, high-tension currents of electricity passing through the stratosphere would light the sky and to a degree turn night into day. With power plants stationed at intermediate posts such as upon the Azores and Bermuda, vessels could cross the Atlantic, propelled and safeguarded at the same time by electricity generated ashore. There would no longer be danger of boiler explosions nor hazards of collisions at sea. Even on moonless, cloudy nights, there still would gleam overhead the faint rays of surging electrical currents, so strong that pilots would be able to distinguish objects miles away.

Normandie Uses U. S. Cruiser System

Dr. Tesla, a tall, slender man with straight silvery hair, lean features and bright blue eyes that belie his seventy-eight years, prefaced his prophecies by pointing out that the Normandie's system of power generation and application was not new—but one which had been adopted long ago in some of the United States cruisers. The principle is one of his own invention.

"The Normandie," he said, "employs an 'electric drive' in which turbines drive generators and generators supply the current to independent motors. In this case the turbines are driven by steam, the generators are of the three-phase type and the motors are of the induction type."

"In many respects the machinery installed on the United States cruisers by former Secretary Josephus Daniels is more remarkable than that on the Normandie on account of the limitations of available space. Moreover, while the Normandie develops only 160,000 horsepower, the cruisers each develop 135,000 horsepower. These cruisers employ the most remarkable engine plants in the world, and I believe that this drive would not have been employed on the Normandie had it not been for the pioneering work done in the United States."

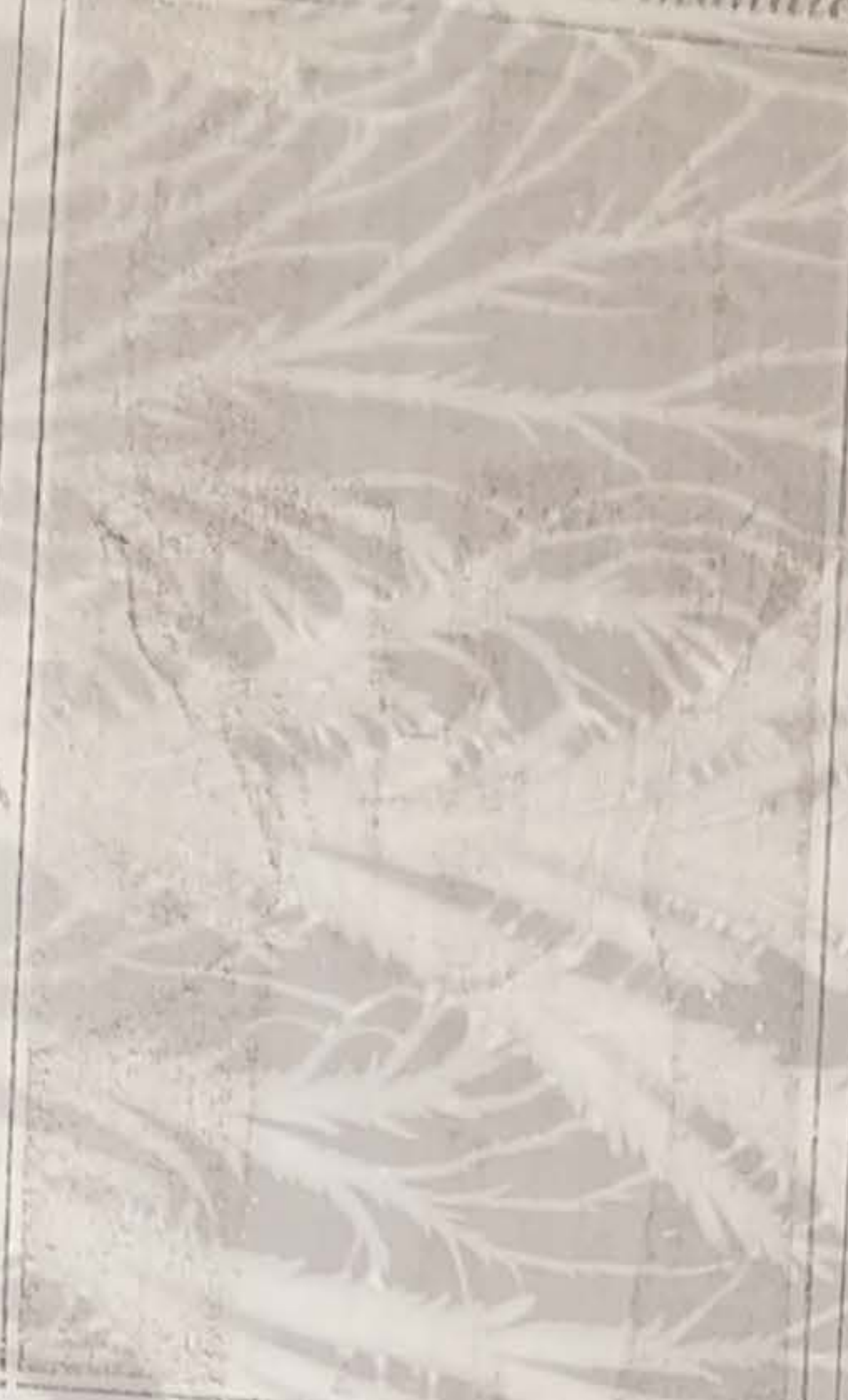
"In view of the adoption on such a large scale of these inventions of mine, it is interesting to recall that I was violently attacked only a few years ago by a professor of marine engineering at Columbia, who claimed the electrical drive was not feasible and that it was folly to undertake it."

"However splendid the machinery on the Normandie might be, the time is not distant when we will have much simpler and better means of propulsion."

Cites His Force Beam as One Way

Here Dr. Tesla recalled the possibilities of his force beam of particles which he announced last year as a potential defensive weapon of great value. One of its aspects is a death ray capable of destroying airplanes and armies. Another is a means of power transmission which could be used to relay immense voltages of electricity over distances limited only by

Not in Awe of Normandie



Herald Tribune photo—Stephen
Nikola Tesla

sity of vast outlays of capital and concerted harmonious endeavor by the chief nations of the world. The latter, he said, would be impossible to achieve at the present time. A third difficulty would be the task of keeping a ship at sea constantly in touch with a threadlike beam of particles from ashore.

Dr. Tesla, therefore, suggested that his other scheme, of stratosphere transmission of electricity, would be a far more feasible means of marine propulsion. The principles of the two plans are entirely distinct. The force beam is a thin barrage of tiny particles discharged at tremendous velocities from a kind of electrical gun. The other invention, which he has not hitherto discussed publicly, is of transmitting high tension currents through the upper air, and receiving them by means of a vertical ionizing beam which would be a sort of invisible electrode. He discussed this yesterday.

Started With Idea in 1897

"There is a method of conveying great power to ships at sea which would be able to propel them across oceans at high speed. This method I conceived between 1897 and 1899, and in Colorado Springs in 1899 I made experiments along this line on a large scale."

"The principle is this: A ray of great ionizing power is used to give to the atmosphere great powers of conduction. A high tension current of 10,000,000 to 12,000,000 volts is then passed along this ray to the upper strata of the air, which strata can be broken down very readily and will conduct electricity very well."

"A ship would have to have equipment for producing a similar ionizing ray. The current which has passed through the stratosphere will strike this ray, travel down it and pass into the engines which propel the ship."

Pet Scheme to Light Ocean

"I will confess that I was disappointed when I made tests along this line on a large scale. They did not yield the results. At the time I used a current of 10,000,000 to 12,000,000 volts of ionizing power. As a source of ionizing power, I employed a powerful arc from the sky. At the time I was only able to connect the arc and the upper strata of the atmosphere, my ray beam to light the ocean at night."

"However, I have made many improvements in my method which I know will be successful. A power plant, for instance, could be placed on the stratosphere, and the sky sufficient objects upon the earth at a safe distance."

Dr. Tesla said that he was working constantly every day to perfect his force beam, his method of stratosphere transmission of power, and a number of other inventions the nature of which he was not ready to disclose.

Powder Near Quezon Home

11 Boxes of Dynamite Found Near Philip's House

MANILA, P. I., June 5.—(Wednesday)—Eleven boxes of dynamite were found today near a few yards from the home of Manuel Quezon, Philippine commonwealth leader, at the mountain retreat of the president.

NEW HERALD TRIBUNE
JUNE 5, 1935

See this article varies slightly from the one in the group from NYPL

9,200 Visitors

minutes. The record still is held by the German Lloyd liner Bremen, which averaged 28.1 knots in 1905.

seen by Dr. Tesla to lie in the necessity of propelling ships, however, were this method as a means of propulsion the difficulties inherent in using power over distances limited only by the curvature of the earth. The difficulty of the earth. The power over distances limited only by the curvature of the earth. The power over distances limited only by the curvature of the earth.

11 Boxes of Explosive Found Near Philadelphia House

Philadelphia, June 5—(Wednesday) A power plant upon the shores of the Atlantic, for the purpose of illuminating the sky, and a number of other inventions the nature of which he was not ready to disclose.

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Human Side of the News

Nikola Tesla, 80-Year-Old Inventor, Explains His "Death Beam."

By Edwin C. Hill
The Globe Trotter of Hearst Metrolone News

THERE is only one man alive who has seven hundred basic patents to his credit. He is 79 years old. His name is Nikola Tesla and he promises us, on the threshold of his 80th year, a magic ray which will supply humanity with a new means of unfailing communication; a new and safe means of guiding ships at sea and bringing them to port; a dependable divining rod for locating gold and other precious metal under the surface of the earth; and fourthly, all of the earth's physical constants.



on, and so has that magical little genius, Steinmetz, whose intelligence dominated the great General Electric plant at Schenectady and, in truth, directly influenced the whole electrical world. But one of these wizards we have with us still in the person of Nikola Tesla.

TO END WAR.

He is working on a means to end war. Mr. Tesla is reaching into the infinite to snatch a bolt of lightning for the salvation, not the slaughter, of mankind.

It will be, if and when perfected, the Tesla death beam—a lightning bolt, literally of millions of volts.

It will be imbued with such horrific energy that a fleet of airplanes invading the air of an enemy would be annihilated, sent earthward in flaming meteors within ten heartbeats.

Two hundred thousand men, horse, foot and artillery, crossing the border of a country, would be dropped in their tracks.

Dr. Tesla will tell you that he cannot help but believe that he is on his way to creating a weapon which will be so irresistible that war will become not only insane but ridiculous.

Submarine warfare, for example, would be impossible if the Tesla death beam materializes.

One human being sitting in a glass tower at Montauk Point, L. I., let us say, could, by the gentle pressure of a forefinger

on an ivory button, project hundreds of miles to sea and 200 feet below the surface, if necessary, a lightning bolt, which would destroy the undersea terror in a blinding flash.

Mr. Tesla, being a practical man and having little use for ever well-meaning idealists, how his fellowmen pretty well, has little faith in peace pacts and treaties. He is convinced that war can be ended only by making it too frightful for the human mind and body to endure.

"War," says Mr. Tesla, "must be converted into plain suicide. No nation, whatever the provocation, will plunge into war if that nation knows positively that it is putting a gun to its temple or a knife to its heart."

Nikola Tesla is an Austrian. He was only 28 years old when he came from the University of Prague to enter the laboratory of the great Edison.

MAN OF MAGIC.

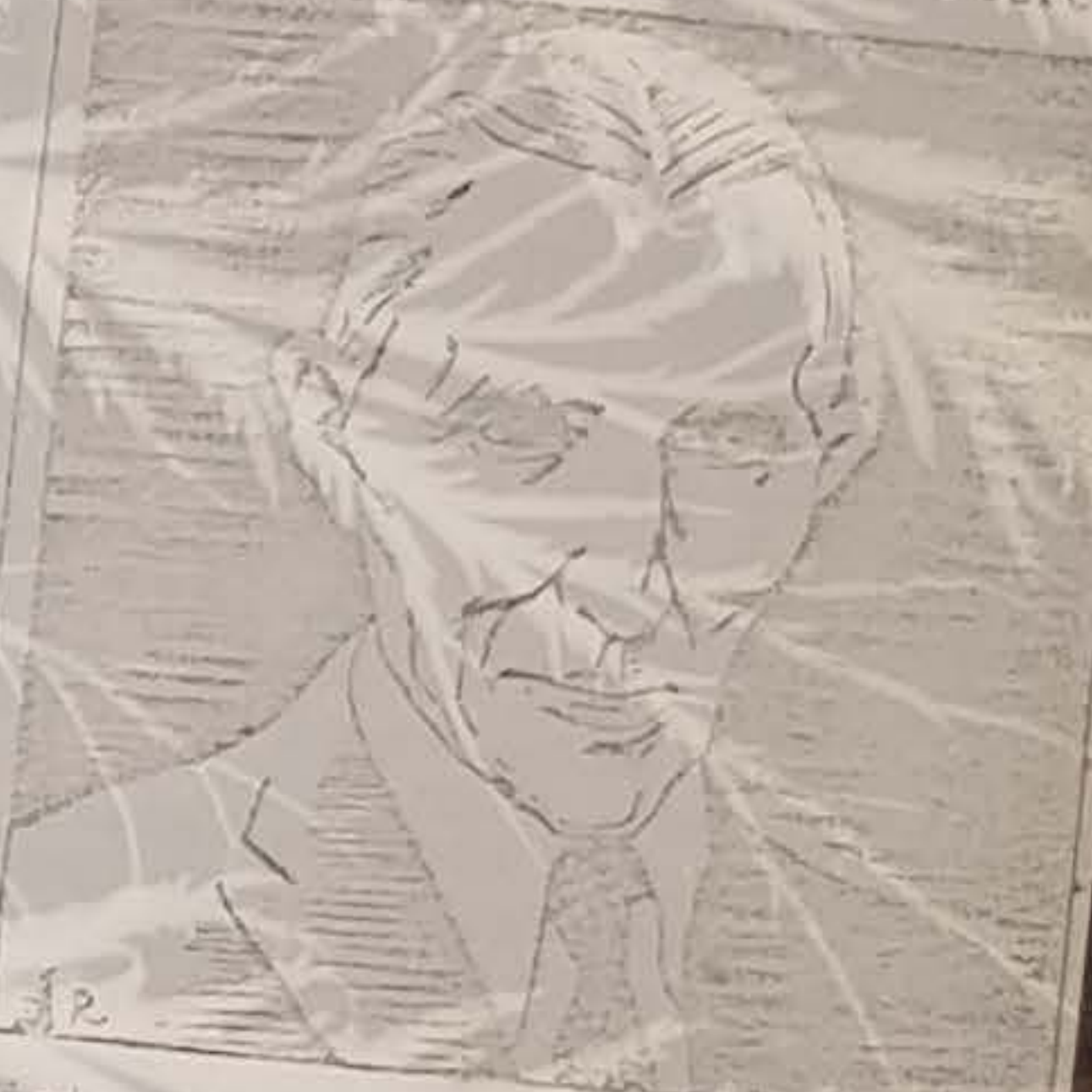
Possibly the fiction (for fiction it was) that Mr. Edison needed little sleep and, in fact, took very little, sprang from the real truth that the terrifically ambitious and energetic young Tesla actually spent whole nights in the Edison laboratory, falling asleep only when sheer fatigue felled him; eating only when the weakness of famine came upon him.

That was his start. For more than fifty years he

has been a man of magic. Fully fledged from his amazing brain, have come marvel after marvel. It was Tesla who gave us the induction motor. It was that discovery which made possible the transmission of light and power by that method.

It was Tesla who gave us innumerable indispensable electrical appliances—dynamoes, transformers, induction coils, oscillators and arc lamps.

In his later years he became fascinated with the possibilities of a transmission of power without wires. His imaginative mentality reached out not merely



into the future, but into the hereafter itself.

Mr. Tesla speculates seriously as to whether or no a man electrocuted in the death chair could be restored to life by the application of an electrical current. He believes, indeed, that the experiment might be successful.

SIGNALS FROM MARS.

It was thirty years ago, when he was conducting experiments at Pikes Peak, that he believes he filched from the air, at that 14,000-foot elevation, electrical signals from Mars.

Mr. Tesla believes, with the late Prof. Lowell, that there are living, human-like creatures on our nearest neighbor in the family of planets and that they are much more intellectually advanced than we are. He believes, indeed, that they have been trying for many centuries to reach our dull intelligences.

It would be a bold skeptic who could lightly discard the theories and predictions of the man who has worked such wonders, this man of fascinating mind who stands today as America's greatest inventor.

ONCE

SOME middle aged men who complain bitterly over not having received a square deal, dissipated the earnings of their younger years in having a good time.

They should remember this when tempted to grumble.

Some period in life must be dedicated to savings and self-discipline if an accumulation is ever to be made.

If not imposed voluntarily in younger years it will be required later.

It is a relief to hear certain old fellows say: "Well, I had a good time during the years when I was physically fit to enjoy it."

By Edgar A. Guest

Just Folks

Summer Cottage Creatures

What strange acquaintances I make
Out at the cottage by the lake.

So many curious things I see,
A different world it seems to be.

The rooms, the walls, the fields are rife
With most fantastic forms of life:

Moth millers of a might size,
Mysterious double-jointed flies;

Spiders and wasps and things that crawl
Through window space and crannied wall;

Mosquitoes, gnats and stinging mites
Buzz round the lamps on Summer nights,

Serving with ghastly frightfulness
Some purpose which I cannot guess

Countless their number and their kind,
And most ingeniously designed;

Strange shapes seem to live and die
Merely to wonder why.

Edgar A. Guest.

My Journal

Aug 10, 1935

G S

ation of the Na- Society, "Daring the and Other Ruins of the r. Douglass describes the climate of the last 1,200 years, able to fix the dates of the forty prehistoric ruins in the region were built and started at 700 A. D. Douglass has a complete tree record back to 700 A. D., eight centuries before the coming of Columbus.

There is unmistakable evidence, he says, that climate was the great factor in the destinies of the people of the Southwest. The ruins were built by their own hands, and the soil could not move them. The great drought of 1276 to 1299 was the beginning of the end for them. The tribes that flourished before the Spanish conquest in the now-barren region were forced to move elsewhere because the soil could no longer grow the crops they needed, but the disaster that overtook them was partly their own fault," Dr. Douglass says.

The Chaco Canyon region is a semi-arid, treeless waste, and here, yet 700 years ago and earlier, pine forest flourished in the area and the soil produced plentiful crops to support a large population. The largest village, Pueblo Bonito, contained 3,000 rooms. Logs from the pine forest served as fuel for the Indians and as a fuel supply. The logs, some of them preserved for many centuries in the cleared houses, are smooth and unpeeled, showing that they were brought from afar by. But there are no trees here by today.

The enormous use of good pine timber in the building of the great communal houses in Chaco Canyon and the contrasting absence of timber there today have a meaning for the desert.

"During excavations by the National Geographic Society at Pueblo Bonito, numbers of ceiling logs were brought to light in perfect condition. Their smooth, unweathered surfaces mean they were cut and peeled and promptly used. There is no scarring by transportation. This suggests an extended forest in the immediate neighborhood of the ruins, without doubt on the mesa above and possibly on the valley floor itself.

"The tree-ring record shows that major droughts have hit the southwestern region once about every 300 years as far back as the record has been deciphered.

"The great drought of 1276-99 was the first major one recorded by the automatic 'rain-gauges' of the trees. Three hundred years before no actual drought was found, but the tree rings gave unmistakable evidence that rainfall was below normal from 1005 to 1035, just before William the Conqueror invaded England and won the Battle of Hastings.

Next Major Drought 270 Years Off

"Three centuries after the 1276-99 drought another major one occurred in 1573-93. During this period the English were beginning to settle Colorado, Virginia, and Mary. Queen of Scots, was executed in England. After the lapse of another 300 years still another great drought was recorded by the tree rings, this time between 1870 and 1904. Should the 300 year cycle continue to hold good, the next great drought will be 270 years from now, about 2200, but of course no one is venturing any forecasts. All the drought periods were followed by years of favorable weather for crops and trees alike, as revealed by thick, health growth-rings in the old logs.

"Besides the major droughts 300 years apart, others also are marked down in the tree-ring diary. There

Science Still Seeks

The Negative Proton

Dr. G. Gamow, the famous physicist now at Georgetown University, is anxious for someone to discover the negative proton. No one has ever found any trace of one existing, but Dr. Gamow, along with other physicists, feels that such a particle ought to exist because it would solve some difficult problems in figuring out the structure of the nucleus of the atom.

Just what the properties of a negative proton would be is the subject of some speculations by Dr. Gamow in a communication to "Nature." The proton as now known is a positively charged particle with a mass equal to a unit atomic weight. The neutron

Expanding Sun Will Explode

Some Day Tesla Predicts

By Nikola Tesla

Before radio-activity became known and as a result of years of meditation I discovered a physical truth of the greatest importance expressed by the statement: "There can be no energy in gross matter except that which is out." The general recognition of this universal principle will sweep away many illusory ideas which have been woven into modern science and lead to a better understanding of the structure and operation of the cosmos. It shows that the immense atomic energy, thought to be due to rotary motions, does not exist. It exposes some of the fallacies of relativity and other theories.

It bears out the view that condensation of the primary substance is a measure provided, for I have established by experiments which admit of no doubt that the sun and other celestial bodies steadily increase in mass and energy and ultimately must explode, reverting to the primary substance.

Activating Rays Linked to Sun

When radio-active phenomena were discovered I was prepared to view them merely as secondary effects of an external radiation, and as no trace of such a disturbance could be detected on earth I concluded that the primary activating rays were of cosmic origin and most likely to emanate from suns closely resembling our luminary. As the first step toward clearing up the mystery I undertook to ascertain whether the sun was charged to a potential sufficiently high to produce the tremendous electro-static repulsion which I had found to be the only force in nature capable of accounting for the phenomena.

The subject required extended investigation, but finally I ascertained with a reasonable degree of certitude, and to my amazement, that the sun was at a constant positive potential of about 216,000,000,000 volts. Thus the secret of the cosmic rays was revealed. Owing to its immense charge, the sun imparts to minute positively electrified particles prodigious velocities which are governed only by the ratio between the quantity of free electricity carried by the particles and their mass, some attaining a speed exceeding fifty times that of light.

"Erroneous Views" Cited

The literature of cosmic rays is remarkable for its extent and almost as much for the erroneous views propounded. In this brief communication I can dwell on only a few of these. It is held, in accordance with findings, that at great altitudes the in-

Man Has Sense of Sound

Comparable to Animals

Animals may have keener senses than man, judging by their ability to respond to situations in their natural environment in a way beyond the ability of man. Tests on the sight of some animals, such as the dog, have shown that their powers are far better than those of man. The ordinary powers of seeing within the range of human vision. Tests have been made on the hearing ability of animals and it has been found that they are no better equipped than man for detecting sounds in the ordinary range of tones. In the higher range of sound some animals are less responsive than man and others more responsive.

Tests were made on the chimpanzee, monkey, cat and guinea pig and the results were reported to the Acoustical Society of America by Dr. J. C. Steinberg. He found that they respond to sound in about the same way as man does. The cat and the guinea pig do not hear the high-pitched tones, those at the top of the piano scale and higher, as well as man, while the chimpanzee and the monkey are more sensitive in these ranges of pitch.

Various methods were used for determining how the animals hear. In the case of the electrical response in the nerves of the ear were measured as the index of hearing. The potential differences that developed between the round window of the inner ear and some other part of the body when the hearing organ was activated and amplified. The chimpanzees and monkeys were trained to press a key and receive food when they heard a tone from a receiver connected to one ear. The guinea pigs were conditioned by letting them hear a tone for a few seconds and then giving them an electric shock. After sufficient repetition of this procedure the animals associated the tone with the coming shock. This resulted in observable changes in the animals' breathing. These changes indicated that the association between the sound and the shock was established. It was not necessary to give the shock.

At frequencies of 1,000 a second or less the hearing sensitivity of the animals was about the same as that of man. At 4,000 cycles and higher the cat and guinea pig fail to hear sounds that are audible to man. In the range of 8,000 cycles and higher the monkey and chimpanzee have a hearing acuity somewhat greater than man.

Medical Case Sets Mark

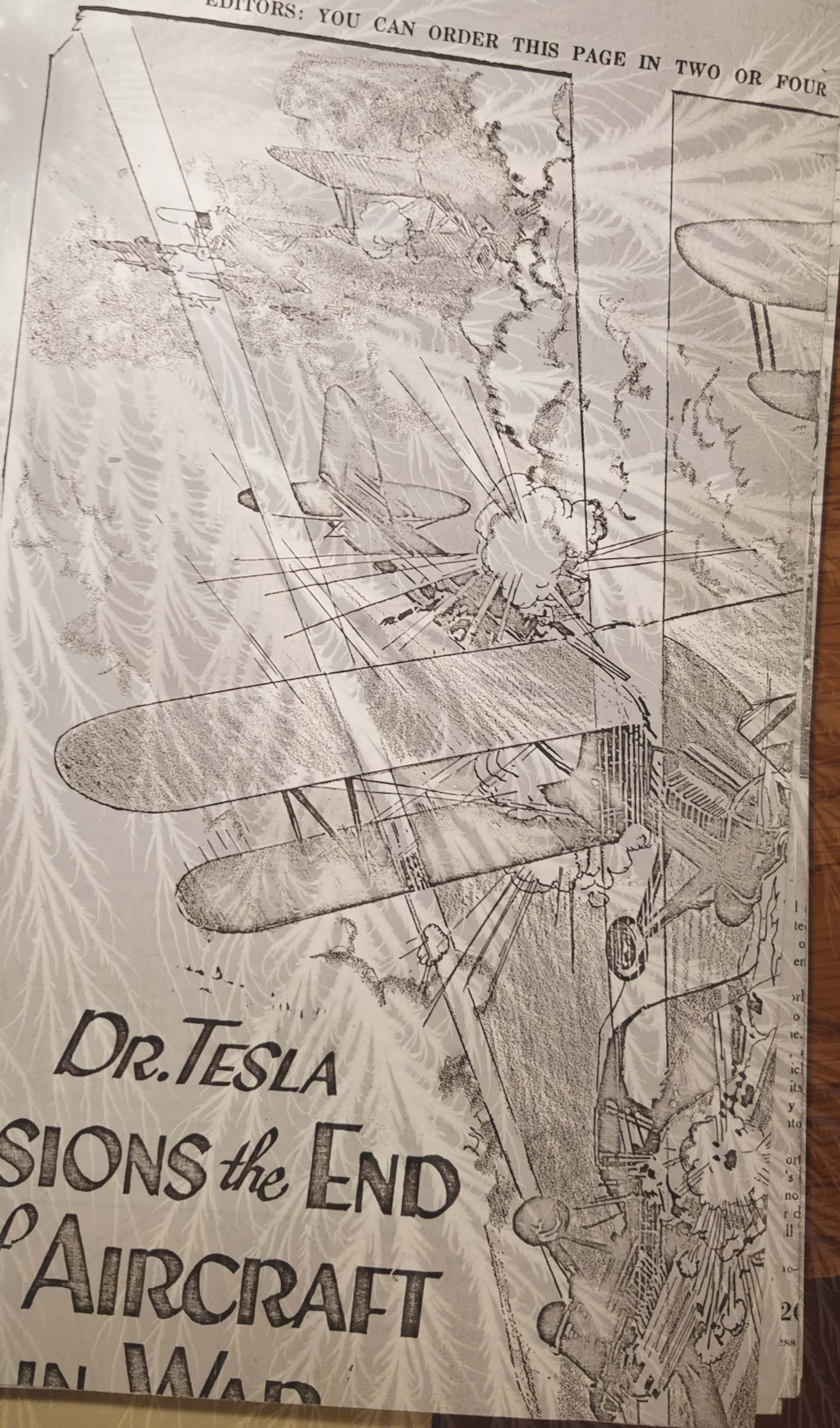
What probably constitutes a record for long distance medical treatment has occurred off the western Australian coast. An apprentice on the bound from Liverpool, outward 2,500 miles away. The captain radioed his symptoms and condition to a powerful Australian station and the western officer directed treatment for several days. The patient improved rapidly, but fearing a relapse the doctor had him taken to a hospital as soon as the steamer reached Albany.

N.Y. Tribune August 18, 1935

Herald-

EDITORS: YOU CAN ORDER THIS PAGE IN TWO OR FOUR

DR. TESLA
**VISIONS *the* END
of AIRCRAFT
IN WAR**



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Whether it is a dream or reality may soon be known. He claims to have created a new agent, silent and invisible, which kills without trace and yet pierces the thickest armor. It is a beam of death and destruction formed of minute particles of matter carrying such tremendous energy that they could bring down a fleet of 10,000 attacking planes and wipe out an army of millions at a distance of 250 miles.

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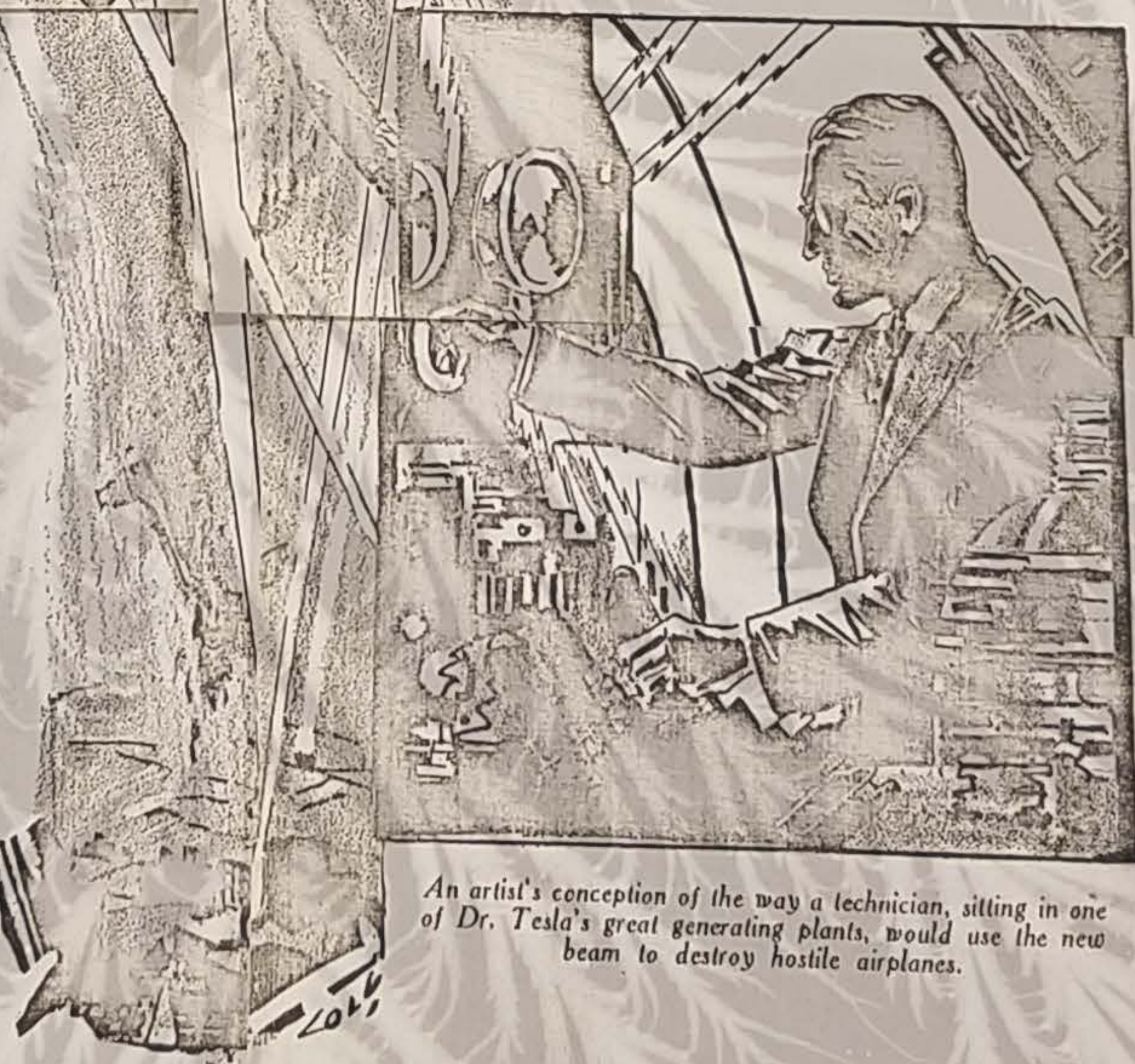
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Tesla on Power Development and Future Marvels

By Nikola Tesla.

I AM a reader of your excellent paper and frequently peruse excerpts of interest to me for future reference.

One of these is an article by William Castle, in your issue of June 25, 1934, dealing with hydro-electric development in which the author characterizes my recent announcement of a new inexhaustible source of power as "nebulous."

A preliminary information is necessarily incomplete, but I always make sure that it is based on demonstrated fact and accurate as far as it goes. My illustrious namesake, Copernicus, used to go twenty times over his scientific statements before giving them out; nevertheless, compared with the attention I bestow upon my own, he might have been considered a careless man.

The utilization of the new and everywhere present power is a rational and practicable plan and not an illusionary scheme like that of harnessing atomic energy, which still holds many men of science under its spell, although there is absolutely no theoretical or experimental evidence to justify such expectation.

The author of the article gives an eloquent account of water power development, recalling vividly to my mind the almost miraculous way in which success with my alternating system was achieved. As I review the past, I realize how fortunate it was that at the time when, after years of fruitless talking to deaf ears, I finally managed to be heard by a few, there was a man in the electrical industry towering above all others, like Samson over the Philistines. A genius of the first order, combining to an unequalled degree, inventive ability and mastery of business, a man truly great, of phenomenal powers—George Westinghouse. He espoused my cause and undertook to wage a war against overwhelming odds.

The alternating current was completely discredited, deemed as deadly and of no commercial value. Edison thought that the wires might be used for hanging laundry to dry. Steinmetz had a very poor opinion of my induction motor. The old interests were powerful and resolved to fight any encroachment on their business by all means fair or foul. But Westinghouse was not dismayed and threw all his energy and resources into the battle of the century. More than once he came near to being snuffed out, but finally he routed his opponents and put the new industry on a firm foundation. It was a monumental achievement unparalleled in the history of technical development. The service he rendered to the world is beyond estimate.

But it took another human dynamo, a genius of a different kind—Samuel Insull—to enlarge on the work of Westinghouse and apply the system on a colossal scale. Insull concentrated his efforts on cheapening the production, transmission and distribution of power. He recognized early the economic advantages of large units and prevailed upon the manufacturers to supply him with huge turbo-generators, regardless of cost. He introduced other improvements raising the efficiency and finally range of central stations and finally realized, practically and successfully, the Super Power System which I had barely suggested in 1893. The results he obtained were such as to astonish engineers, and his bold example was quickly followed here as well as in other countries, saving immense sums of money to the consumers.

At present the work of Westinghouse and Insull is carried further in every corner of the globe, providing new resources, transforming cities and communities and contributing to the safety, comfort and convenience of hundreds of millions. Let us thank the stars that these great pioneers lived in our time, as otherwise we

Proportion.

By HENRY N. KOST.

PEOPLE are talking much to about what is wrong with our country. The wrong looks big and threatening at times. We don't have to fear. What is right with our country is so big that if our gaze is fixed on the good we see, what is wrong becomes very small in comparison. And, what is more, what is right with our country will constantly grow until what is wrong will be lost sight of and go to its natural nothingness.

Liberty, N. Y.

might have had to wait a century for the benefits we now enjoy.

Another item of interest to me in your flattering editorial of July 12, 1934, with a fly in the ointment, is that you state that examination of performance does not in recent cases fulfill my prophecy. Perhaps not, but on the whole I have been extraordinarily successful. You would be surprised to know how many of my discoveries and inventions are in extensive use. To give an illustration, I may refer to my wireless system of transmission of energy which is looked upon by many as a pipe dream.

These uninformed people should be told that "wireless" is not a single invention but an art involving the use of many of them, and of these I have contributed the fundamental and most essential, and they are universally employed. There is as yet no pressing necessity for wireless transmission of power in industrial amounts, but as soon as it arises the system will be applied and with perfect success.

Still another item which has interested me is a report from Washington in the World-Telegram of July 13, 1934, to the effect that scientists doubt the death ray effect. I am quite in agreement with these doubters and probably more pessimistic in this respect than anybody else, for I speak from long experience.

Rays of the requisite energy can not be produced, and then, again, their intensity diminishes with the square of the distance. Not so the agent I employ, which will enable us to transmit to a distant point billions of times more energy than is possible by any kind of ray.

We are all fallible, but as I examine the subject in the light of my present theoretical and experimental knowledge I am filled with deep conviction that I am giving to the world something far beyond the wildest dreams of inventors of all time.

New York.

Asking the Churchgoer for Added Contribution.

By Patrick F. Scanlan, Managing Editor for the Brooklyn Tablet.

Mr. Stelzle asked the churches to give \$2,500,000 a year for public relief. I showed they are giving far more than that now. Mr. Stelzle said the churches are exempt from \$10,000,000 of taxes. I showed they render services four or five times the total of that amount. Mr. Stelzle replies by repeating his demand.

John Jones on my block goes to church every Sunday. Besides contributing to the upkeep of the church, he gives approximately \$20 a year to unemployment relief and \$26 to the upkeep of the parish school. This \$46 represents a contribution to public welfare—to the city's needs. The families next door to Mr. Jones do not go to church. They do not contribute to unemployment relief through the church or to educational work.

Mr. Stelzle's suggestion is not that the latter contribute anything but that the former give more than he is already giving. It is a demand that is illogical, unreasonable and unjust.

Brooklyn.

By Mr. Steingut

By Best Citizens.

As a former resident of Brooklyn and one who has been identifying for more than a quarter of a century all movements for civic and social betterment, I must enter earnest protest against your indiscriminate attack on Irwin Steingut, minority

Thinks Mr. Farley May Be Champion Humorist.

By N. Sutherland.

Our peripatetic Postmaster General, James A. Farley, is certainly a born comedian, if nothing else.

Farley is now gallivanting about the country proclaiming to all who may hear: "During Mr. Roosevelt's long period in office, embracing two successful terms as Governor of New

WORLD TELEGRAM
JULY 24, 1934

NEW YORK

Herald



WEDNESDAY, JULY 11, 1934

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New York Tribune Inc.)

Vol. XCIV No. 32,014

THE WEATHER

Today: Fair and warmer
Tomorrow: Fair and warmer,
followed by showers
Temperatures Yesterday: Max., 70; Min., 67
Detailed Report on Page 24

Republicans Offer County Reforms for Entire State

Ready to Go 'Whole Way' with Lehman Plan for Simplification in the Form of Government

The Governor is offering a 'Surprise' Session Opens

Amendments in One Bill Exempted from Job Cut

By higher taxes, longer hours and prices, Henri asserts, Hitler is reducing the German standard of living to a condition of near-starvation, providing for unemployment.

figures, he says, accounted for 1933, for 13.3 millions of extra men and 4.1 unemployed. Hitler took office the Legislature, was 12 millions employed, primarily to millions out of work in three millions had only condition the records! These are the radical workers whom affecting the to starve. He claims counties must been responsible for a bill, and not entire working class. Thus they

Page 1

Beam to Kill Army at 200 Miles, Tesla's Claim on 78th Birthday

Death Ray Also Available as Power Agent in Peace Times, Inventor Declares

By Joseph W. Alsop Jr.

Dr. Nikola Tesla, inventor of poly-phase electrical current, pioneer in high frequency transmission, predecessor of Marconi with the wireless, celebrated his seventy-eighth birthday yesterday by announcing his invention of a beam of force somewhat similar to the death ray of scientific romance.

It is capable, he believes, of destroying an army 200 miles away; it can bring down an airplane like a duck on the wing, and it can penetrate all but the most enormous thicknesses of armor plate. Since it must be generated at stationary power plants by machines which involve four electrical devices of the most revolutionary sort, Dr. Tesla considers it almost wholly a defensive weapon. In peace times, he says, the beam will also be used to transmit immense voltages of power over distances limited only by the curvature of the earth.

As a hors d'oeuvre to this Jules Vernean announcement, Dr. Tesla disclosed that he has lately perfected instruments which flatly disprove the present theory of the high physicists that the sun is destined to burn itself out until it is a cold cinder



Herald Tribune photo—Steffen
Nikola Tesla

floating in space. Dr. Tesla stated that he is able to show that all the suns in the universe are constantly growing in mass and heat, so that the ultimate fate of each is explosion.

Dr. Tesla refused to describe specifically the instruments in question in both discoveries, or even to disclose the principles upon which they

(Continued on page fifteen)

Bid Too Low, City Refuses To Sell Bonds

Banks 'Ganged' to Get \$72,000,000 Issue at Cheap Price, LaGuardia Says After 4% Offer

May Seek Private Investors' Market

Wall St. Defends Yield Basis and Insists Huge Syndicate Was Justified

The city's widely heralded \$72,000,000 bond and corporate stock sale failed to come off yesterday after Mayor F. H. LaGuardia and Comptroller Joseph D. McGoldrick and other members of the Sinking Fund Commission had read the five tenders for the issue submitted by a banking syndicate headed by the Chase National Bank and the banking firm of Henry Clews & Co. and the Emigrant Industrial Savings Bank.

All the bids except that of the savings bank, which was for but \$2,000,000 of the serial bonds, were rejected and the good-faith deposit checks returned to the bankers. And after them went a thundering denunciation by Mayor LaGuardia.

Accuses Banks of "Ganging"

The Mayor charged that the bank had "ganged" to put in an unfair tender. He warned them that it would give them one more chance to make an honest, bona fide offer, they didn't accept that chance to city would get the money elsewhere.

The bids were opened in the Comptroller's office at noon. It was a rather momentous occasion, as the city was about to receive bids for the first 10-term bond issue in more than 10 years. The Mayor and Bernard Deutsch, President of the Board of Aldermen, stood by, tensely expectant as the bids were taken from the Comptroller McGoldrick began to read the tenders, but it was not before it was apparent that the

U.S. Revenue Up Billion Over '33, Report Shows

Processing Taxes, Levied for First Time, Account for 37 1/2 Millions of Gain

From the Herald Tribune Bureau

WASHINGTON, July 10.—Internal revenue collections increased in the fiscal year 1934 over 1933 by more than \$1,000,000,000. Detailed tabulations made public today by Guy T. Helvering, Commissioner of Internal Revenue, showed that agricultural processing taxes, which were imposed

Colombia Hails Roosevelt as He Pays Brief Visit

Destroyers Greet President, Then Olaya Rides Through Crowded Streets With Him

By The United Press

CARTAGENA, Colombia, July 10.—In a gesture of good will President Roosevelt stepped on foreign soil here today and extended greetings from the people of the United States to their neighbors in Latin America.

Against a background of widely cheering multitudes of natives, the

Women Testify To Reno Losses At Bunco Trial

Kathryn Beeson Says She Was Swindled of \$177,000 by Pocketbook Trick

Other Lost Life Savings

Third Victim Got 'Rubber' Check for Consolation

The trial of William J. Graham and Leames C. McKay, political and gambling powers of Reno, Nev., and John J. Egleston, of Worcester, Mass., continued yesterday in United States District Court with the testimony of two women who had been buncoed for more than a quarter of a million dollars. The men are being tried before Judge Carroll C. Hicks and a jury on charges of using the mails to defraud.

Miss Kathryn Beeson, member of a prominent Pennsylvania family and a sister of Charles Beeson, steel magnate, repeated the story she had given at previous trials, relating how she had been nearly swindled of \$177,000 by two chance acquaintances who employed the old pocketbook trick to do the job. One of the swindlers, Frank C. Davis, is now serving a four-and-a-half-year term in the penitentiary at Atlanta.

Mrs. Mary E. Callahan, who, with her husband, the late John H. Callahan, was proprietor of a Rochester hotel, took the stand and testified that while she and her husband were traveling in California they were hoodwinked out of \$141,000—all but \$4,000 of their life savings—by virtually the same method used by Davis and his confederates on Miss Beeson. Mrs. Callahan identified Noble John Moore, whom she knew in California as Jack Corbett, and Egleston as those who had swindled her. Both Moore and Egleston were convicted of defrauding the Callahans, although the former is not on trial. He is expected to testify as a government witness.

Graham and McKay, the two principal defendants, are accused as backers of the nation-wide bunco ring which centered its operations in Reno. In the case of each of the alleged victims of the ring, the Riverside Bank in Reno was used for the transfer of funds or liquidation of securities into cash for betting on horse races or playing the stock market.

Edward Gilsdorf, retired Chicago business man, finished his testimony begun on Monday and introduced a new variation in the game. He said that instead of sending him out of Reno empty-handed the swindlers who had persuaded him to put up \$150,000 to collect a large wager on a horse race, all of which he eventually lost, "made it up to him" by drawing a check for the amount on the Chase National Bank. The check later proved to be worthless, however.

Others who told stories of being victimized by the bunco gang were James McShinney, a section foreman of a construction company, who lost \$15,000, his wife, and her mother, of Buffalo, N. Y., where he is foreman of a knitting factory. Mr. Hermel said he became entangled with the systematic swindling machine in April, 1931, when he met two operators in Los Angeles. After the bunco game had been played and Mr. Hermel was on the point of handing over \$23,000 to the confidence men, caution overtook him at the last moment. He refused to part with the money. Seated in a Reno resort, discussing the proposition, some one offered him a cigar. The next thing he knew, Mr. Hermel said, was that he was off to Buffalo on a train. His money was gone and he could give no explanation for its absence.

The trial will continue at 10 a. m. today.

Mt. Rainier Stamp Design Is Announced by Farley

Issue Will Be Placed on Sale

Atlantic City Dog Bar Now Open for Business



And one of its features is that the patrons don't have to pay anything for drinking water. A veterinarian paid for its construction

Beam to Kill Army at 200 Miles, Tesla's Claim on 78th Birthday

(Continued from page one)

are built. He said that at some date soon he expected to make the full details public in scientific journals or before scientific bodies. Since he considers the beam of force a defensive and therefore a pacifist weapon, he hopes to be able to present it in full for the first time at the disarmament conference at Geneva. He also said that minor parts of each of the discoveries are still in the theoretical, or blueprint stage, but he pointed out that his method of work has almost always been purely mental.

Inventor Reviews Past

The aging inventor, a tall, thin, almost spiritual figure in the sort of brown cutaway suit that older men wore before the World War, received interviewers in one of the public rooms in the Hotel New Yorker, where he lives. Before he would speak of his present work he reviewed his past achievements, which entitle him, more than Edison, Steinmetz or any other, to be called the father of the power age. He has 30 patents to his credit, and not a few of them are for epoch-making discoveries, but over and over again he has been ridiculed as a lunatic. He recalled this and his work together as if to prepare the way for his announcements.

He came to the idea of a beam of force, he said, because of his belief that no weapon has ever been found that is not as successful offensively as defensively. "The perfect weapon of defense, he felt, would be a frontier wall, impenetrable and extending up to the limits of the atmosphere of the earth.

Creates Ray in Free Air

Such a wall, he believes, is provided by his beam of force. It is produced by a combination of four electrical methods or apparatuses. First and most important is a mechanism for producing rays and other energy manifestations in free air. Hitherto vacuum tubes have always been necessary. Second is an apparatus for producing, unheard-of quantities of electrical current and for controlling it when produced. The current is necessary as power for the first mechanism. Without this, no rays of sufficient strength could be produced. The third is a method of intensifying and amplifying the second process, and the fourth is a method of producing "immense electrical repellent force."

"These four inventions in combination enable man to loose in free air forces beyond conception," Dr. Tesla remarked mildly. "By scientific application we can project destructive energy in thread-like beams as far as a telescope can discern an object. The range of the beams is only limited by the curvature of the earth. Should you launch an attack in an area cov-

most positive accuracy. Like many other things I have done they require no previous experiment once they are properly conceived. There are a few details to be finished—my calculations might be perhaps 10 per cent off at present—and then the whole thing will be presented to the world. It has always been my practice to give the world a sort of preview of what I am doing so that a reception is prepared."

Power Supply Unlimited

"I should also say, and this is perhaps as important as anything else about it, that in this apparatus all limitations as to electric force and the quantity of electricity transmitted have been removed." It was evident that Dr. Tesla's work on the force beam as a peace-time means of power transmission was far less advanced than his work on it as a defensive weapon. He did not describe the nature of the receiver which will transform the force beam into useful power, though he declared that he had designed one, nor was he able to show just how the dangers of having such death-dealing but invisible beams traveling through the air could be surmounted.

Dr. Tesla was far less definite in his description of the experiments which led to his revolutionary prediction of the future of the sun and its system than he was when talking of the force beam. He had, he said, detected "certain motions in the medium that fills space, and measured the effects of these motions." The results of the experiments had led him "inescapably" to the conclusion that such bodies as the sun are taking on mass much more rapidly than they are dissipating it by the dissipation of energy in heat and light.

"Heat to Kill All Peoples"

He pointed out that his theory means a future for the earth as different from the general belief as the future of the sun. It is generally held that life on the earth will cease when the sun grows so cold that the earth temperature drops to a point where life can no longer be supported. Dr. Tesla prophesied that life on the earth will cease because the planet will grow too warm to support life, and he believes that life will then begin on outer planets now too cold. He said that his discovery not only allowed him to predict a very different future for the heavenly bodies from that now generally expected for them, but also to calculate in a new way their age.

Nor were these two discoveries, of a force beam and a new future for the universe the only new things Dr. Tesla had to offer. The completely new and unlimited source of energy which he stated he was at work on is, he said, still under examination by him. Since he first spoke of it great strides have been made, and the complete announcement of it is to be expected in a comparatively short time. Finally there was the electric bath.

Paralysis Held Hereditary in Harvard Survey

Evidences of Family Susceptibility Discovered in 2 P. C. of Clinic Cases

May Affect Use of Serum

Discovery Hailed as Greatest Advance in Many Years

Special to the Herald Tribune

CAMBRIDGE, July 10.—Susceptibility to infantile paralysis is due to an inherent constitutional deficiency, a possibility previously unconsidered, it was stated today by Dr. W. Lloyd Aycock, of the Harvard Infantile Paralysis Commission. The conclusion was reached as a result of exhaustive experiment conducted by Dr. Aycock and his colleagues over a long period of years. Dr. Aycock, an authority on the dread poliomyelitis, has, it is believed, made the most important discovery in years in aid of science's perennial fight against the disease. While Dr. Aycock hastened to stress that the conclusion regarding inherited susceptibility in no way resembles a "cure," he does believe that this new fact concerning the disease will permit a promising method of attack.

"It may indicate," said Dr. Aycock, "that some organs are unable to do the work necessary to combat the poliomyelitis virus and it may be that if it can be identified the trouble can be remedied. Or," he continued, "it may enable us to select the relatively small proportion of susceptibles from the many and protect them by extraordinary precautions too drastic for general application."

20 Per Cent Had Family History

An intensive study, Dr. Aycock explained, resulted in the discovery. Working at the Boston Clinic of the Commission, it was found that 20 per cent of these treated had a family history of the disease. In three well isolated communities in Vermont—Waitsfield, Barton and Grand Isle—still stronger evidence was found that susceptibility is hereditary for 51 per cent of the patients treated had a family history.

Studying children that had the disease, then waiting while they married and had children of their own who contracted the disease, Dr. Aycock was able to trace the disease through two generations, an essential in testing his hereditary theory. Whole families also were studied. In one case paralysis was found in as many as five generations of a single family tree, and in another nineteen cases were discovered in a single family over a period of forty years.

During the tests particular care was taken to eliminate the possibility that the disease had been transmitted by infection or contagion. "On the speculation that such cases might arise out of an infected house, or lack of cleanliness," says Dr. Aycock, "there is the further fact, one of a number, in which one child was stricken in Nova Scotia and one of the younger children was a victim after the family had moved to Massachusetts."

"Another chart," he said, "is the record of a case in Massachusetts, where another member of the family who had never seen the first and who lived in Italy also contracted the disease." That the disease skips generations presumably possessed of the same susceptibility is explained by Dr. Aycock in that not every one has his susceptibility tested by exposure to the virus.

May Aid Use of Serum

The nature of the fight, in view of this discovery, has not been determined as yet, but the hereditary theory offers additional possibilities in the use of serum. The value of serum in the fight has thus far not been definitely proved, but is Dr. Aycock's belief that future work on this project will be greatly aided by the commission's discovery.

Dr. Aycock summarizes the new advance in research as follows:

1. It tells us a piece of truth.
2. It may enable us to select the relatively small proportion of susceptibles from the many and protect them by extraordinary precautions too drastic for general application.

"To close schools is undesirable in any event unless gatherings of children outside of school are also pre-

Accident

Miss 19 Jan report that of \$14, a for Jamal with her w which mont find h Miss hand said, news Police teller.

Doctor

Brother

A prepar New Y fantile by en guinea exper No Dr but to be the y call f twelve six yu tution and the ers th less. be in the p ventu Dr. he ha the s subjecti A the s securi and stre the de Th his mak the s in a fluid colum infan formi attei the de com Th the v test. Willi direi labeli clini lego Colu Jacki Miss Gold Th Sati

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"Another chart," he said, "shows a record of a case in Massachusetts where another member of the family who had never seen the first child lived in Italy also contracted the disease." That the disease spreads from one generation to another, presumably possessing the same susceptibility is explained by Dr. Aycock in that not every child is susceptible tested by the virus.

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The nature of the fight, in this discovery, has not been determined as yet, but the theory offers additional possibilities in the use of serum. The value of the fight has thus far not been definitely proved, but Dr. Aycock's belief that future work on this will be greatly aided by the discovery.

Dr. Aycock summarizes the advance in research as follows:

"1. It tells us a piece of truth about the disease. It tells us that a relatively small proportion of the population are susceptibles from the many and protect them by extraordinary precautions too drastic for general application."

"To close schools is undesirable in any event unless gatherings of children outside of school are avoided."

But he declines to give the details of the decline. He says the decline is due to a mind first, the dreams, but that it is that under-act, and that Cath-

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Graham and McKay, the two principal defendants, are accused as backers of the nation-wide bunco ring which centered its operations in Reno. In the case of each of the alleged victims of the ring, the Riverside Bank in Reno was used for the transfer of funds or liquidation of securities into cash for betting on horse races or playing the stock market.

Edward Gilsdorf, retired Chicago business man, finished his testimony begun on Monday and introduced a new variation in the game. He said that instead of sending him out of Reno empty-handed the swindlers who had persuaded him to put up \$150,000 to collect a large wager on a horse race, all of which he eventually lost, "made it up to him" by drawing a check for the amount on the Chase National Bank. The check later proved to be worthless, however.

Others who sadly told stories of being defrauded by the bunco ring, the life savings; and Reinhold Hermel, of Buffalo, N. Y., where he is foreman of a knitting factory. Mr. Hermel said he became entangled with the systematic swindling machine in April, 1931, when he met two operators in Los Angeles. After the bunco game had been played and Mr. Hermel was on the point of handing over \$25,000 to the confidence men, caution overtook him at the last moment. He refused to part with the money. Seated in a Reno resort, discussing the proposition, some one offered him a cigar. The next thing he knew, Mr. Hermel said, was that he was off to Buffalo on a train. His money was gone and he could give no explanation for its absence.

The trial will continue at 10 a. m. today.

Mt. Rainier Stamp Design Is Announced by Farley

Issue Will Be Placed on Sale on August 3

From the Herald Tribune Bureau

WASHINGTON, July 10.—Announcement of the design for the three-cent Mount Rainier stamp of the national parks series of postage stamps now being issued by the Postoffice Department and also of the date and place of first-day sale was made today by Postmaster General James A. Farley.

The Mount Rainier stamp will be arranged horizontally and will be enclosed in a narrow double-line border. The central design on the stamp will be a view of Mount Rainier with a reproduction of Mirror Lake in the foreground, in which the peak and surrounding trees are reflected. Across the top of the stamp will be the words "U. S. Postage" in solid Gothic lettering, arranged in three horizontal lines. Below this inscription, printed in two lines, are the words "Three Cents." In the center of a white disc at the bottom of the stamp will be the solid Gothic numeral "3."

This Mount Rainier stamp will be placed on first-day sale in Washington, and at the Longmire, Wash., postoffice on August 3, 1934. This stamp will be placed on general sale throughout the country the following day.

'Combat Cross' Approved For Police Medal Design

5 to Receive New Decoration, 17 to Get Other Awards

Police Commissioner John F. O'Ryan announced yesterday that a design had been approved for a new police medal, "the combat cross," five of which will be awarded to police heroes this year for the first time. The award of police decorations may be made in Central Park this year, instead of at City Hall. The new medal is in the form of a Maltese cross in black and green enamel with a gold edge. In the center are the arms of the City of New York, with the inscription "Combat Cross, New York Police Department."

The five new awards will bring to twenty-two the total number of decorations to be given this year to policemen. There are eleven medals established by gifts to the department for the purpose, one departmental medal, two medals of honor and three posthumous medals to be given. Though the names of the recipients, it is said, have been chosen, they have not yet been made public.

Commissioner O'Ryan said he would take up with James E. Flanagan, Civil Service Commissioner, the advisability of conferring on the recipients of the award at cross an award of half a point on their Civil Service rating, as is done for the recipients of the other decorations. The new medal was selected by a committee made up of the Police Commissioner, Harold Fowler, Harold L. Allen and Martin H. Meaney. First, Second and Fifty Deputy Commissioners, respectively; and Alan R. Stuyvesant, secretary to the Police Commissioner.

The aging inventor, a tall, thin, brown cutaway suit that older men wore before the World War, received interviewers in one of the public rooms in the Hotel New Yorker, where he lives. Before he would speak of his present work he reviewed his past achievements, which entitle him, more than Edison, Steinmetz or any other, to be called the father of the power age. He has 30 patents to his credit, and not a few of them are for epoch-making discoveries, but over and over again he has been ridiculed as a lunatic. He recalled this and his work together as if to prepare the way for his announcements.

He came to the idea of a beam of force, he said, because of his belief that no weapon has ever been found that is not as successful offensively as defensively. The perfect weapon of defense, he felt, would be a frontier wall, impenetrable and extending up to the limits of the atmosphere of the earth.

Such a wall, he believes, is provided by his beam of force. It is produced by a combination of four electrical methods or apparatuses. First and most important is a mechanism for producing rays and other energy manifestations in free air. Hitherto vacuum tubes have always been necessary. Second is an apparatus for producing unheard-of quantities of electrical current and for controlling it when produced. The current is necessary as power for the first mechanism. Without this, no rays of sufficient strength could be produced. The third is a method of intensifying and amplifying the second process, and the fourth is a method of producing "tremendous electrical repellent force."

"These four inventions in combination enable man to loose in free air forces beyond conception," Dr. Tesla remarked mildly. "By scientific application we can project destructive energy in thread-like beams as far as a telescope can discern an object. The range of the beams is only limited by the curvature of the earth. Should you launch an attack in an area covered by these beams; should you, say, send in 10,000 planes or an army of a million, the planes would be brought down instantly and the army destroyed."

"The plane is thus absolutely eliminated as a weapon; it is confined to commerce. And a country's whole frontier can be protected by one of the plants producing these beams every 200 miles. Nor should they be much more costly than an ordinary power plant."

It Is an Electric Gun

The beam of force itself, as Dr. Tesla described it, is a concentrated current—it need be no thicker than a pencil—of microscopic particles moving at several hundred times the speed of artillery projectiles. The machine into which Dr. Tesla combines his four devices is, in reality, a sort of electrical gun.

He illustrated the sort of thing that the particles will be by recalling an incident that occurred often enough when he was experimenting with a cathode tube. Then, sometimes, a particle larger than an electron, but still very tiny, would break off from the cathode, pass out of the tube and hit him. He said that he could feel a sharp, stinging pain where it entered his body, and again at the place where it passed out. The particles in the beam of force, ammunition which the operators of the generating machine will have to supply, will travel far faster than such particles as broke off from the cathode, and they will travel in concentrations, he said.

As Dr. Tesla explained it, the tremendous speed of the particles will give them their destruction-dealing qualities. All but the thickest armored surfaces confronting them would be melted through in an instant by the heat generated in the concussion.

Some Parts Still Unmade

Such beams or rays of particles now known to science are composed always of fragments of atoms, whereas, according to Dr. Tesla, his would be of microscopic dust of a suitable sort. The chief differentiation between his and the present rays would appear to be, however, that his are produced in free air instead of in a vacuum tube. The vacuum tube rays have been projected out into the air, but there they travel only a few inches, and they are capable only of causing burns or slight disintegration of objects which they strike.

Dr. Tesla declared that the two most important of the four devices involved in his force beam generator, the mechanism for producing rays in free air and the mechanism for producing great quantities of electrical current, had both been constructed and demonstrated by actual experiments. The two intensifying and amplifying apparatuses are not yet in existence, but he displayed the most perfect confidence that when they are, they will work as he expects them to do.

"These effects," he said, "are of the kind that can be calculated with the

most advanced than his work on it as a defensive weapon. He did not describe the nature of the receiver which will transform the force beam into useful power, though he declared that he had designed one, nor was he able to show just how the dangers of having such death-dealing but invisible beams, traveling through the air could be surmounted.

Dr. Tesla was far less definite in his description of the experiments which led to his revolutionary prediction of the future of the sun and its system than he was when talking of the force beam. He had, he said, detected "certain motions in the medium that fills space, and measured the effects of these motions." The results of the experiments had led him "inevitably" to the conclusion that such bodies as the sun are taking on mass much more rapidly than they are dissipating it by the radiation of energy in heat and light.

He pointed out that his theory means a future for the earth as different from the general belief as the future of the sun. It is generally held that life on the earth will cease when the sun grows so cold that the earth temperature drops to a point where life can no longer be supported. Dr. Tesla prophesies that life on the earth will cease because the planet will grow too warm to support life, and he believes that life will then begin on outer planets now too cold. He said that his discovery not only allowed him to predict a very different future for the heavenly bodies from that now generally expected for them, but also to calculate in a new way their age.

Nor were these two discoveries, of a force beam and a new future for the universe, the only new things Dr. Tesla had to offer. The completely new and unlimited source of energy which he stated he was at work on is, he said, still under examination by him. Since he first spoke of it great strides have been made, and the complete announcement of it is to be expected in a comparatively short time.

Finally there was the electric bath. The idea of a bath of electricity to cleanse the person far more completely than water ever could has always been at the back of Dr. Tesla's mind. Many years ago he built a machine which performed the function successfully, but, because it cost too much and was not without its dangers, he dropped it as impractical. Lately he has improved it so much that he feels it is now fit for general use.

Works Twenty Hours Daily

"You may think this is a lot of work for an old man like me to have on his hands," he said with a little smile. "You may think I have too many big things—I have told you three—on my hands. But I have worked for sixty years now, and I have worked twenty hours a day. I have such a store of ideas that I can see clearly. I have concentrated on my subject. My brain works better now than it ever did when I was a young man. I am capable of far more than I was in what they call 'your prime.'"

He smiled again. The white, parchmenty skin, drawn tight over a finely built bony structure, creased round his eyes and mouth. He admitted to being a little thinner than last year, but, he explained, every one dries up as time goes on, and there is nothing in being thin that can interfere with work.

He was asked a question about birthday celebrations and congratulations from all over the world, he said, but the one which pleased him most was from his sister in Yugoslavia, Mrs. Marica Kosanovic, who is three years younger than he and "the smartest in all our family." He talked for a while of his family, recalling all the inventors there were—five recorded—and students in his ancestry.

"As for celebration," he added, "my only celebration is a little work, and these small disclosures of results."

Sapiro Trial Listed for Aug. 6

The case of Aaron Sapiro, attorney, and Sam Roth, charged with trying to influence a jury, was placed on the trial calendar for August 6 by Judge Murray Hulbert in United States District Court yesterday. The defendants are charged with misconduct in connection with the trial of Sidney Paris, Murray O. Harwood, and others, for selling stock through fraudulent use of the mails. Sapiro is under \$1,000 bail and Roth \$2,000, pending trial.

Giel Found Dead in Hotel

Irene Mosson, thirty years old, of 114 South Street, Easton, Pa., was found dead of poison last night in her room at the Hotel Wellington, Seventh Avenue and Fifty-fifth Street, an empty vial by her side. She had come here a week ago to seek work. She left a note to a sister, Miss Marie Mosson, of 178 Dean Street, Brooklyn, a registered nurse, who went to the hotel and identified the body.

and had children of their own who contracted the disease. Dr. Aycock was able to trace the disease through two generations, an essential in testing the hereditary theory. Whole families also were studied. In one case paralysis was found in as many as five generations of a single family tree, and in another nineteen cases were discovered in a single family over a period of forty years.

During the tests particular care was taken to eliminate the possibility that the disease had been transmitted by infection or contagion. "On the speculation that such cases might arise out of an infected house, or lack of cleanliness," says Dr. Aycock, "there is the further fact, one of a number, in which one child was stricken in Nova Scotia and one of the younger children was a victim after the family had moved to Massachusetts."

"Another fact," he said, "is that who had never seen the disease and who lived in Italy also contracted the disease." That the disease skips generations presumably possessed of the same susceptibility is explained by Dr. Aycock in that not every one has his susceptibility tested by exposure to the virus.

May Aid Use of Serum

The nature of the fight, in view of this discovery, has not been determined as yet, but the hereditary theory offers additional possibilities, the use of serum. The value of serum in the fight has thus far not been definitely proved, but is Dr. Aycock's belief that future work on this project will be greatly aided by the commission's discovery.

Dr. Aycock summarizes the new advance in research as follows:

- "1. It tells us a piece of truth."
- "2. It may enable us to select a relatively small proportion of susceptibles from the many and protect them by extraordinary precaution too drastic for general application."

"To close schools is undesirable in any event unless gatherings of children outside of school are also prevented. Selectivity would obviate the need for any such general precaution. Or it might make possible the vaccination only of those who need it instead of vaccination of all another measure that seems too drastic."

"It may indicate that some organs are unable to do the work necessary to combat the poliomyelitis virus and may be that if it can be identified the trouble can be remedied."

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Tesla's Wireless Power Dream Nears Reality

Boise City, Okla., April 1 (U.P.)—Nikola Tesla's forecasts of commercial transmission of electric power without wires tonight appeared near realization.



Nikola Tesla.

Equipment was being made ready for a test run of a motor car over a stretch of railway track to Farley, N. M., with power supplied by radio. Success would open an ultra-modern system of transportation.

The run is expected to be made as soon as the most efficient mechanical method is determined for transferring energy from the radio-

impelled motor to the car drive wheels.

Test runs in the Santa Fe Railway yards here during the week recalled the experiments Tesla began thirty years ago with wireless transmission of signals and power. Two Californians developed the equipments here, however.

Plans Wireless Hydro-Electric

Tesla, the Serbian-American electrical genius, produced incandescent effects in lamps without filaments in 1903 and performed other weird feats without wires. Now, almost 77, he still is experimenting in New York and has designed a plant for wireless transmission of hydro-electric power, which he proposed should be erected at Niagara Falls.

Details of how the radio-powered motor car equipment works are

closely guarded secrets, but were understood to involve use of high frequency current and short wave radio with receiving elements similar to those in television sets.

Predicts New Home Machinery

Use of high frequency currents was the basis of Tesla's phenomenal early experiments which led him to predict that some day houses would be lighted and electric machinery run without wires connecting them to power plants.

An odd-looking set of electrical and gasoline motored apparatus, including a high-powered radio transmitter with big coils and short antenna, has been set up here to waft current to the specially-motored car for the run of 30 to 40 miles.

CHEAP CHAMPAGNE

Champagne cocktails reached a new low post-repeal price yesterday when the Hotel Roosevelt sold them for 50 cents at the bar. The announced aim was to push American champagne.

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Albee Theatre Bldg.
MAIN 4-6426
FLATBUSH
803 Flatbush Avenue,
Entrance 2135 Caton Ave.

...to President Roosevelt, who soon will meet with Maxim Litvinoff, Soviet Commissar for Foreign Affairs.

Page 10

MORALS for OLD

...a daring new book about sex, from any other you may have before. It is a book written especially for men and women who are not to face the facts, and who want to see the real truth about sex and sexual desires.

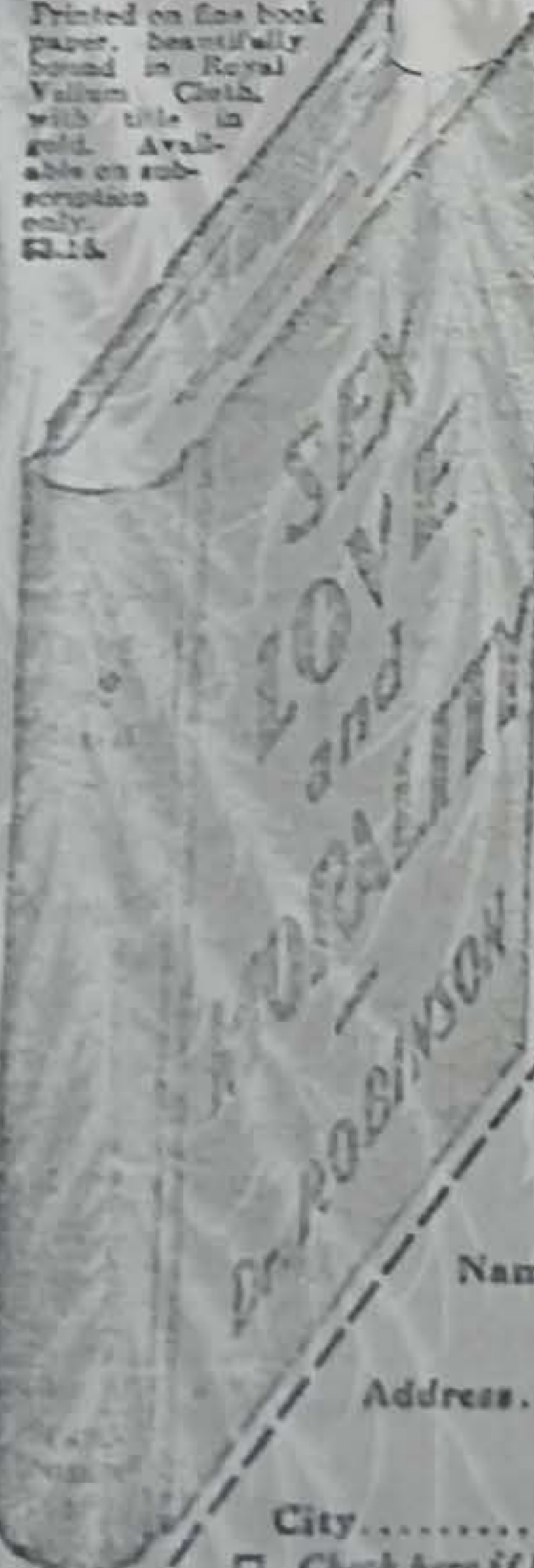
...a startling new book, by Dr. William J. Robinson, discusses in the plainest language everything pertaining to the sex life, in marriage and out of it. Is it wise to think of morals only as it concerns sex? Is it right to think of love as being possible only in marriage? These vital questions, and many more are discussed openly and frankly in this great book. It gives you an amazing new view of the whole question of sex, as seen by a famous Sexologist whose works are praised the world over.

This Partial Table of Contents gives you a faint idea of the value and the completeness of Dr. Wm. J. Robinson's wonderful new book, entitled:

SEX, LOVE and MORALITY

Principles of General and Sexual Morality
Premarital Relations
Extra-Marital Relations, with 10 illustrations
When Love Complicates the Problem
Frankness Between Husband and Wife
The Domestic Trio
Love and Sexual Intercourse
Wrong View of Sanctions and Duties of Love
Sexual Favors
The Double Standard
Unnatural Methods of Love
Definition of Prostitution
Prostitute's Moral Level
Prostitute's Mental Level
Ethics of Prostitution

Does Prostitution Supply a Genuine Need?
Will Prostitution Ever Disappear Entirely?
What to Do With the Prostitute
Three Kinds of Prostitutes
Homosexuality, Transvestitism, and Sadism
Rape
Incest
Masturbation
Abortion
Prevention or Birth Control
Divorce
Alimony
Breach of Promise
Illegitimacy
Mistreatment
Sex—What to Do About It



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wards which it turns, in the direction of the opposite side where the reverse condition exists. It is well to remember this in such a storm. If the observer sees a leaning funnel, he is in no immediate danger, but if the funnel appears straight he should run for shelter at once.

It will now be easy to show how a large and very heavy body, such as a loaded railroad car or locomotive, can be lifted by the tornado and transported to considerable distance. American locomotives, which are the biggest in the world, may have a length of 66 and a width of 11½ feet, presenting thus 760 square feet in horizontal projection. At the moment the whirl strikes the vehicle, the wheels, connections and other obstacles under the main body arrest the motion of the air, causing a static pressure of 138 pounds per square foot in excess of that of the atmosphere. But as determined above, owing to the vacuum, a pressure difference of four inches of mercury (that is, two pounds per square inch or 288 pounds per square foot) is maintained, making the whole difference of pressure between the spaces under and above the locomotive 288+138=426 pounds per square foot. The total upward push exerted on the exposed area of 760 square feet is thus 323,760 pounds, which is much more than the weight of such a locomotive (estimated at 280,000 pounds when fully equipped for service).

Ordinarily, the weight should be much smaller; and one can readily see that the vehicle may be instantly raised in a spiral, accelerated and hurled away tangentially to great distance. The average person may be surprised that an insignificant vacuum is sufficient for so stupendous a display of force; but the figures afford an unmistakable proof. I may add that I have assumed minimum values which will be, in all probability, greatly exceeded.

The constant fear of danger from tornadoes and the great losses of life and property which they cause in certain parts make it very desirable to find some means of effectively combating, if not preventing them. Whenever man attempts to interfere with the order of things determined by immutable laws, he finds that his efforts are utterly insignificant when compared with the vast movements of energy in Nature.

One of the greatest possible achievements of the human race would be the control of the precipitation of rain. The sun raises the waters of the ocean and winds carry them to distant regions, where they remain in a state of delicate suspension until a relatively feeble impulse causes them to fall to earth. The terrestrial mechanism operates much like an apparatus releasing great energy through a trigger or priming cap.

If man could perform this relatively trifling work, he could direct the life-giving stream of water wherever he pleased, create lakes and rivers and transform the arid regions of the globe. Many means have been proposed to this end, but only one is operative. It is lightning, but of a certain kind.

More than 35 years ago, I undertook the production of these phenomena and, in 1899, I actually succeeded, using a generator of 2,000 horsepower, in obtaining discharges of 18,000,000 volts carrying currents of 1,200 amperes, which were of such power as to be audible at a distance of 13 miles. I also learned how to produce just such lightnings as occur in Nature, and mastered all the technical difficulties in this connection. But I found that even the small

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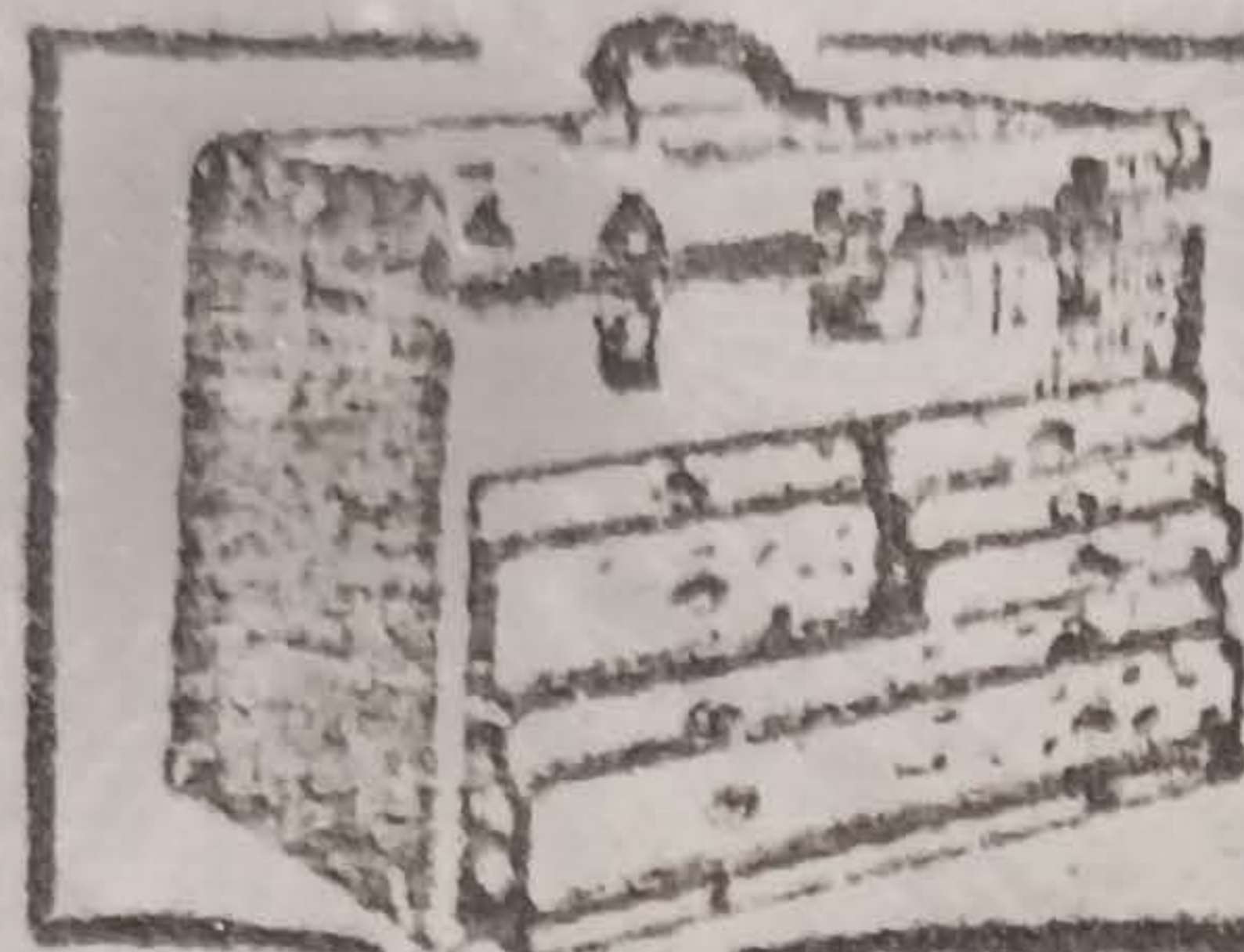
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One of the greatest possible achievements of the human race would be the control of the precipitation of rain. The sun raises the waters of the ocean and winds carry them to distant regions, where they remain in a state of delicate suspension until a relatively feeble impulse causes them to fall to earth. The terrestrial mechanism operates much like an apparatus releasing great energy through a trigger or priming cap.

If man could perform this relatively trifling work, he could direct the life-giving stream of water wherever he pleased, create lakes and rivers and transform the arid regions of the globe. Many means have been proposed to this end, but only one is operative. It is lightning, but of a certain kind.

More than 35 years ago, I undertook the production of these phenomena and, in 1899, I actually succeeded, using a generator of 2,000 horsepower, in obtaining discharges of 18,000,000 volts carrying currents of 1,200 amperes, which were of such power as to be audible at a distance of 13 miles. I also learned how to produce just such lightnings as occur in Nature, and mastered all the technical difficulties in this connection. But I found that even the small

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HUGO GERNSBACK, EDITOR

H. WINFIELD SECOR, MANAGING EDITOR



Unknown Short Waves

An Editorial By HUGO GERNSBACK

WE ARE apt to talk quite glibly about short waves—day in and day out. We use the instrumentality of short waves to receive music and talk from the Antipodes, and we use them for dozens of our other requirements, day in and day out; but, when it comes to the waves themselves, practically nothing is known about them! They are still a book sealed tight with seven seals.

So far, most of our experimental and research work has been concerned with the generation and the effect of short waves; but what happens to these waves between the transmitting antenna and your receiving set is still a deep mystery.

While we know in a general way that waves are reflected by the so-called Kennelly-Heaviside and Appleton layers, which gives rise to "skip effects," very little is known outside of this fact. We do know that the upper rarefied atmospheric strata reflect the radio waves, somewhat as a curved mirror would reflect light; still, this statement does not always hold true either, and other things are happening, most of which we do not understand as yet.

For instance, only recently, Signor Marconi on his yacht "Electra" did some constructive experimental work upon a 3/5-meter band. Normally, the effect of such a wave should not go beyond the horizon; because at these ultra-short wavelengths, as scientists think, the waves assume the physical characteristics of light, and therefore cannot go beyond the horizon, any more than a searchlight can go around the curve of the earth.

It is true that, as Marconi pointed out, light waves suffer a certain amount of refraction; so that you actually can see them a little below the horizon, but not much. This, however, does not explain how Marconi could send and receive short waves over a distance of 160 miles, when a light beam would not go more than fifty miles at the most.

We are, therefore, face to face with a new mystery of short waves; since they do not seem to behave "according to Hoyle." Something else happens here that we do not understand. The chances are that at this point our good friend Dr. Nikola Tesla steps into the breach. For many years, this illustrious savant, the most distinguished living inventor of today, has claimed that all radio transmission, whether on long or short waves, is not done by free waves in space at all, but that it is done by currents transmitted through the earth! Asked by me some years ago, how he explains transmission from an airplane to the ground,

Tesla stated that this is nothing but a *condenser* or capacity effect, wherein the ground was one plate and the plane another. This is not at all illogical, when it is considered that submarines can send and receive radio messages while totally submerged; always providing that their aerials are highly insulated and are not short-circuited by the salt water. The same is the case in exploration of the deepest caves that have, as yet, been reached by man. There is no trouble in signalling to these caves, and transmission and reception is always remarkably easy.

When Marconi, therefore, now transmits ultra short waves beyond the horizon, you may be sure that the ground effect, or the so-called *ground-wave*, has a lot to do with it; and future experimental and scientific research into this field will no doubt affirm or reject the theory.

There is still a tremendous amount of experimental work to be done in the exploration of radio waves. It has always been a source of wonder to me why short-wave experimenters have not tried their hand at "underground reception." This means of reception was first tried out on a large scale by the late Dr. James Harris Rogers of Hyattsville, Md. All during the war, by means of buried insulated cables, which rested in trenches anywhere from 3 to 6 feet below the surface of the earth, Dr. Rogers was able to receive regularly European stations, with an almost total absence of static. He could even receive such stations when a thunderstorm was raging overhead!

For those experimenters who reside in the country, I would suggest that they try their hand at *underground reception* for short waves. The trick is rather simple; all that is necessary is to bury a rubber-covered wire in the ground, after digging a trench some 20 to 50 feet in length, and then cover the cable. This then is your new aerial. It should even be possible, today, to use a transposition aerial with two feeder lines running in each direction, and bring the twisted cable into the set. This would do two things: it would no doubt improve reception, and it would certainly do away with a lot of natural static as well as "man-made" static.

Here is an extremely interesting field for the experimenter who wishes to accomplish something worthwhile and who wishes to leave the beaten track. The editors would be pleased to hear from those who have made experiments in short-wave underground reception, and the results will, of course, be published for the benefit of all.

SHORT WAVE CRAFT IS PUBLISHED ON THE 5th OF EVERY MONTH

This is the November, 1933, Issue—Vol. IV, No. 7. The next Issue Comes out November 5th

Editorial and Advertising Offices - 96-98 Park Place, New York City

sent to President Roosevelt, who soon will meet with Maxim Litvinoff, Soviet Commissar for Foreign Affairs.

TESLA CLAIMS MACHINE TO TAP COSMIC ENERGY

Continued from First Page.

years of laboratory search and scientific experimentation have been disposed of.

"I shall not announce the scientific principles of the discovery and describe the mechanical means I have devised for carrying it out, for the present. It is sufficient at this time to say that I have performed experiments and obtained results from which I am able to calculate what the mechanism may be expected to perform. Much, of course, remains to be accomplished, but it is work not necessarily of a creative kind; it can be done by many, and, hence development to the point of actual operation may be enormously speeded up.

"WILL FLO WAT NIGHT."

"Night will not interrupt the flow of the new power supply. The disappearance of the sun below the horizon will not shut it off.

"The central-plant engine which will mechanize the cosmic energy and shoot it electrically to the other side of the world or the other side of the street will operate on an entirely new principle, and will develop hundreds of thousands of horsepower.

"Any number of such central plants can be built, so there is no limit to the volume of power which it will be possible to develop for the turning of machinery—for the running of trains and automobiles, the driving of ships, the operating of factories, the myriad different motor tasks now performed by engines and machines which derive their power from the regular fuels of industry.

CITES "ABSURD REPORT."

"My statement of this discovery and invention, the result of nearly a third of a century of scientific toil, should serve to quiet the absurd report which has got about that I have perfected a portable engine which by extricating atomic energy will drive the largest steamship across the ocean. I have smashed probably trillions of atoms, and have definitely determined that they contain no available energy. The theory that they do is a futile dream. But the new cosmic power, the harnessing of the energy of the universe to the machinery of men, that is not a dream."

The world of science lists Dr.

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EDITORIAL PHONY
Hydack 4-8000.

Device to Harness Cosmic Energy Claimed by Tesla

Predicts New Power Will Soon Displace All Present Fuels; Could Be Wirelessly.

Nikola Tesla, the celebrated physicist, recognized in the scientific world as the foremost living inventor,

announces that "at a date not distant" a new source of power will be available everywhere, displacing coal, oil, gas, and the other established fuels of industry. The inventor authorizes the statement that the mechanism is designed to revolutionize industry will be, when he presents it as his crowning achievement in the field of applied science, the result of thirty years of search and experimentation into and with the mysterious force which for want of a more precise terminology is called cosmic energy.



NIKOLA TESLA
Sees New Power in Universal Use.

which is designed to revolutionize industry will be, when he presents it as his crowning achievement in the field of applied science, the result of thirty years of search and experimentation into and with the mysterious force which for want of a more precise terminology is called cosmic energy.

"PRESENT EVERYWHERE."

Dr. Tesla said:

"This new power for the driving of the world's machinery will be derived from the energy which operates the universe, the cosmic energy, whose central source for the earth is the sun, and which is everywhere present in unlimited quantities.

"From the actual mechanical apparatus which I have developed for utilizing this energy, the power to drive engines and machines can be transmitted, either by wire or by my wireless system, as preferred, from central plants which may be located wherever desired, to any point on the globe, whether on land or sea.

"When the new power becomes commercially available, there will be no further necessity for depending on coal, oil, gas, or any other of the common fuels.

"NEED NOT BE DISTANT."

"Because no man can foretell with assurance how swiftly or how laggardly a revolutionizing scientific discovery and its mechanical complement will be commercially introduced, it is impossible for me to say how soon the new universal power will be in use. The time, however, need not be distant. The scientific uncertainties and mechanical difficulties with which I have dealt through thirty

Continued on Page 5, Column 1.

Board Approves Contract for Dam

OLYMPIC, Wash., Oct. 31 (AP).
The Columbia Basin Commis-

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Tremendous NEW POWER soon to be unleashed

By Carol Bird

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Several of these inventions or discoveries will be looked upon as "miracles" by many people, for Mr. Tesla has long been a scientist years ahead of his time, one whose advanced theories have alternately stamped him a "madman" and a wizard.

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"I am not yet prepared to dwell on the details of the project, for they must be checked before my findings can be formally announced. I have worked on the development of the underlying principles for many years. From the practical point of view of the engineer engaged in power development, the first investment will be relatively very great, but once a machine is installed it may be depended on to function indefinitely, and the cost of operation will be next nothing.

My power generator will be of the best kind—just a big mass of steel and aluminum, comprising a stationary and rotating part, peculiarly designed. I am planning to develop and transmit it to a distance by a new system now untried. The direct-current transmission lines can be

"Such a source of power obtainable everywhere will solve many problems with which the human race is confronted. My alternating system has been the means of harnessing 30,000,000 horsepower of waterpower, and there are projects now going on all over the world which will eventually double that amount. But, unfortunately, there is not enough waterpower to satisfy present needs, and everywhere inventors and engineers are endeavoring to unlock some additional store of energy."

WILL the smashing of the atom lead to this new power energy? Let Mr. Tesla answer:

"The public is, naturally, led to expect a great revolution through the harnessing of atomic power, but that is an illusion. Atomic energy is not available for work. I operated many years ago apparatus of a capacity of 2000 horsepower and tension of 18,000,000 volts with which trillions of atoms were smashed in a fraction of a second. I generated all sorts of intense and destructive rays, but found no trace of any energy which should have been liberated through the shattering of atomic structures, according to theory. For the last thirty years I have warned my fellow scientists that there is nothing to be expected in this field except some specific effects due to changes in the atomic structure which may have more or less value."

Beyond adding that the new form of energy which he has been investigating many years would be available at any place in the world in unlimited quantities, and that the machinery for harnessing it would last more than 500 years, Mr. Tesla would say little more on the subject. Just when the power will become available for practical purposes he could not predict with any degree of precision. In a few years, perhaps, he ventured to say.

Mr. Tesla then talked of several other projects on which he has been working by way of relief from too much concentration on the main piece of work. He described one of his other interests, one highly dramatic, which stirs the imagination and which, doubtless, will sound too revolutionary to most people. But it must not be forgotten, as Mr. Tesla points out, that the ideas of television and radio and airplane were scoffed at in their infancy.

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pied with some trivial things in the scheme of life might announce that it was going to rain.

Continued Mr. Tesla: "In 1893, while engaged in certain investigations, I became convinced that a definite image formed in thought must, by reflex action, produce a corresponding image on the retina, which might possibly be read by suitable apparatus. This brought me to my system of television, which I announced at that time.

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"An invention of mine enables me to transmit simultaneously, and without any interference whatsoever, hundreds of thousands of distinct impulses through the ground just as though I had so many separate wires. I did not contemplate using any moving part—a scanning apparatus or a cathodic ray, which is a sort of moving device, the use of which I suggested in one of my lectures of that period.

"Now if it be true that a thought reflects an image on the retina, it is a mere question of illuminating the same properly and taking photographs, and then using the ordinary methods which are available to project the image on a screen.

"If this can be done successfully, then the objects imagined by a person would be clearly reflected on the screen as they are formed, and in this way every thought of the individual could be read. Our minds would then, indeed, be like open books."

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After a discussion of his new scientific findings, Mr. Tesla turned to the subject of his personal source of energy and what he considers the real values of life.

"One of the most fundamental and

also one of the saddest facts in human life is well brought out in a French proverb which, freely translated, means: 'If Youth had the knowledge and Age the power of doing,'" said Mr. Tesla. "Our condition of body and mind in old age is merely a certificate of how we have spent our youth. The secret of my own strength and vitality today is that in my youth I led what you might call a virtuous life.

"I have never dissipated. When I was a young man I understood well the significance of that old French proverb, although I doubt that I had even heard it then. But I seemed to have a clear understanding while still young that I must control my passions and appetites if I wanted to make some of my dreams come true.

"So with this in view, quite early in life I set about disciplining myself, planning out a program of living for

what I considered the sane and worthwhile life.

"Since I love my work above all things, it is only natural that I should wish to continue it until I die. I want no vacation—no surcease from my labors. If people would select a life work compatible with their temperaments, the sum total of happiness would be immeasurably increased in the world. "Many are saddened and depressed by the brevity of life. 'What is the use of attempting to accomplish anything?' they say. 'Life is so short. We may never live to see the completion of the task.' Well, people could prolong their lives considerably if they would but make the effort. Human beings do so many things that pave the way to an early grave.

"First of all, we eat too much, but this we have all heard said often before. And we eat the wrong kinds of

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foods and drink the wrong kind of liquids. Most of the harm is done by overeating and underexercising, which bring about toxic conditions in the body and make it impossible for the system to throw off the accumulated poisons.

"My regime for the good life and my diet? Well, for one thing, I drink plenty of milk and water.

"Why overburden the bodies that serve us? I eat but two meals a day, and I avoid all acid-producing foods. Almost everybody eats too many peas and beans and other foods containing uric acid and other poisons. I partake liberally of fresh vegetables, fish or meat sparingly, and rarely. Fish is reputed as fine brain food, but has a very strong acid reaction, as it contains a great deal of phosphorus. Acidity is by far the worst enemy to fight off in old age.

"Potatoes are splendid, and should be eaten at least once a day. They contain valuable mineral salts and are neutralizing.

"I believe in plenty of exercise. I walk eight or ten miles every day, and never take a cab or other conveyance when I have the time to use legpower. I also exercise in my bath daily, for I think this is of great importance. I take a warm bath, followed by a prolonged cold shower.

"Sleep? I scarcely ever sleep. I come of a long-lived family, but it is noted for its poor sleepers. I expect to match the records of my ancestors and live to be at least 100.

"MY SLEEPLESSNESS does not worry me. Sometimes I doze for an hour or so. Occasionally, however, once in a few months, I may sleep for four or five hours. Then I awaken virtually charged with energy, like a battery. Nothing can stop me after such a night. I feel great strength then. There is no doubt about it but that sleep is a restorer, a vitalizer, that it increases energy. But on the other hand, I do not think it is essential to one's well-being, particularly if one is habitually a poor sleeper.

"Today, at 77, as a result of well-regulated life, sleeplessness notwithstanding, I have an excellent certificate of health. I never felt better in my life. I am energetic, strong, in full possession of all my mental faculties. In my prime I did not possess the energy I have today. And what is more, in solving my problems I use but a small part of the energy I possess, for I have learned how to conserve it. Because of my experience and knowledge gained through the years, my tasks are much lighter. Contrary to general belief, work comes easier for older people if they are in good health, because they have learned through years of practice how to arrive at a given place by the shortest path."

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"So with this in view, quite early in life I set about disciplining myself, planning out a program of living for

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"Since I love my work above all things, it is only natural that I should wish to continue it until I die. I want no vacation—no surcease from my labors. If people would select a life work compatible with their temperaments, the sum total of happiness would be immeasurably increased in the world.

"Many are saddened and depressed by the brevity of life. 'What is the use of attempting to accomplish anything?' they say. 'Life is so short. We may never live to see the completion of the task.' Well, people could prolong their lives considerably if they would but make the effort. Human beings do so many things that pave the way to an early grave.

"First of all, we eat too much, but this we have all heard said often before. And we eat the wrong kinds of

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foods and drink the wrong kind of liquids. Most of the harm is done by overeating and underexercising, which bring about toxic conditions in the body and make it impossible for the system to throw off the accumulated poisons.

"My regime for the good life and my diet? Well, for one thing, I drink plenty of milk and water.

"Why overburden the bodies that serve us? I eat but two meals a day and I avoid all acid-producing foods. Almost everybody eats too many peas and beans and other foods containing uric acid and other poisons. I partake liberally of fresh vegetables, fish or meat sparingly, and rarely fish is reputed as fine brain food, but has a very strong acid reaction, as it contains a great deal of phosphorus. Acidity is by far the worst enemy to fight off in old age.

"Potatoes are splendid, and should be eaten at least once a day. They contain valuable mineral salts and are neutralizing.

"I believe in plenty of exercise. I walk eight or ten miles every day, and never take a cab or other conveyance when I have the time to use legpower. I also exercise in my bath daily, for I think this is of great importance. I take a warm bath, followed by a prolonged cold shower.

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"Today, at 77, as a result of well-regulated life, sleeplessness notwithstanding, I have an excellent certificate of health. I never felt better in my life. I am energetic, strong, in full possession of all my mental faculties. In my prime I did not possess the energy I have today. And what is more, in solving my problems I use but a small part of the energy I possess, for I have learned how to conserve it. Because of my experience and knowledge gained through the years, my tasks are much lighter. Contrary to general belief, work comes easier for older people if they are in good health, because they have learned through years of practice how to arrive at a given place by the shortest path."

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Great scientific projects.

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"My power generator will be of the simplest kind—just a big mass of steel, copper and aluminum, comprising a stationary and rotating part, peculiarly assembled. I am planning to develop electricity and transmit it to a distance by my alternating system now universally established. The direct current system could also be employed if the heretofore insuperable difficulties of insulating the transmission lines can be overcome.

"Such a source of power obtainable everywhere will solve many problems with which the human race is confronted. My alternating system has been the means of harnessing 30,000,000 horsepower of waterpower, and there are projects

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now going on all over the world which will eventually double that amount. But, unfortunately, there is not enough waterpower to satisfy present needs, and everywhere inventors and engineers are endeavoring to unlock some additional store of energy."

WILL the smashing of the atom lead to this new power energy? Let Mr. Tesla answer:

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Beyond adding that the new form of energy which he has been investigating many years would be available at any place in the world in unlimited quantities, and that the machinery for harnessing it would last more than 5,000 years, Mr. Tesla would say little more on the subject. Just when the power will become available for practical purposes he could not predict with any degree of precision. In a few years, perhaps, he ventured to say.

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"An invention of mine enables me to transmit simultaneously, and without any interference whatsoever, hundreds of thousands of distinct impulses through the ground just as though I had so many separate wires. I did not contemplate using any moving part—a scanning apparatus or a cathodic ray, which is a sort of moving device, the use of which I suggested in one of my lectures of that period.

"Now if it be true that a thought reflects an image on the retina, it is a mere question of illuminating the same properly and taking photographs, and then using the ordinary methods which are available to project the image on a screen.

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MANY NEW ROUTES OPENED ACROSS STATE

Fortunately for the people of Kansas City and the Southwest in this Chicago world's fair year, the tremendous progress made by the state highway department of Missouri, in the construction of Missouri highways has opened up to the tourist many new and vastly interesting routes across Missouri. Thousands of tourists from the West and Southwest are this year, crossing Missouri who have never crossed the state before. Many Missouri cities of great historical interest have been placed directly on the path of the people bound for the Chicago world's fair and the East.

Newly paved highways over shorter routes make it easy for the tourist to visit numerous places of great interest that were heretofore inaccessible.

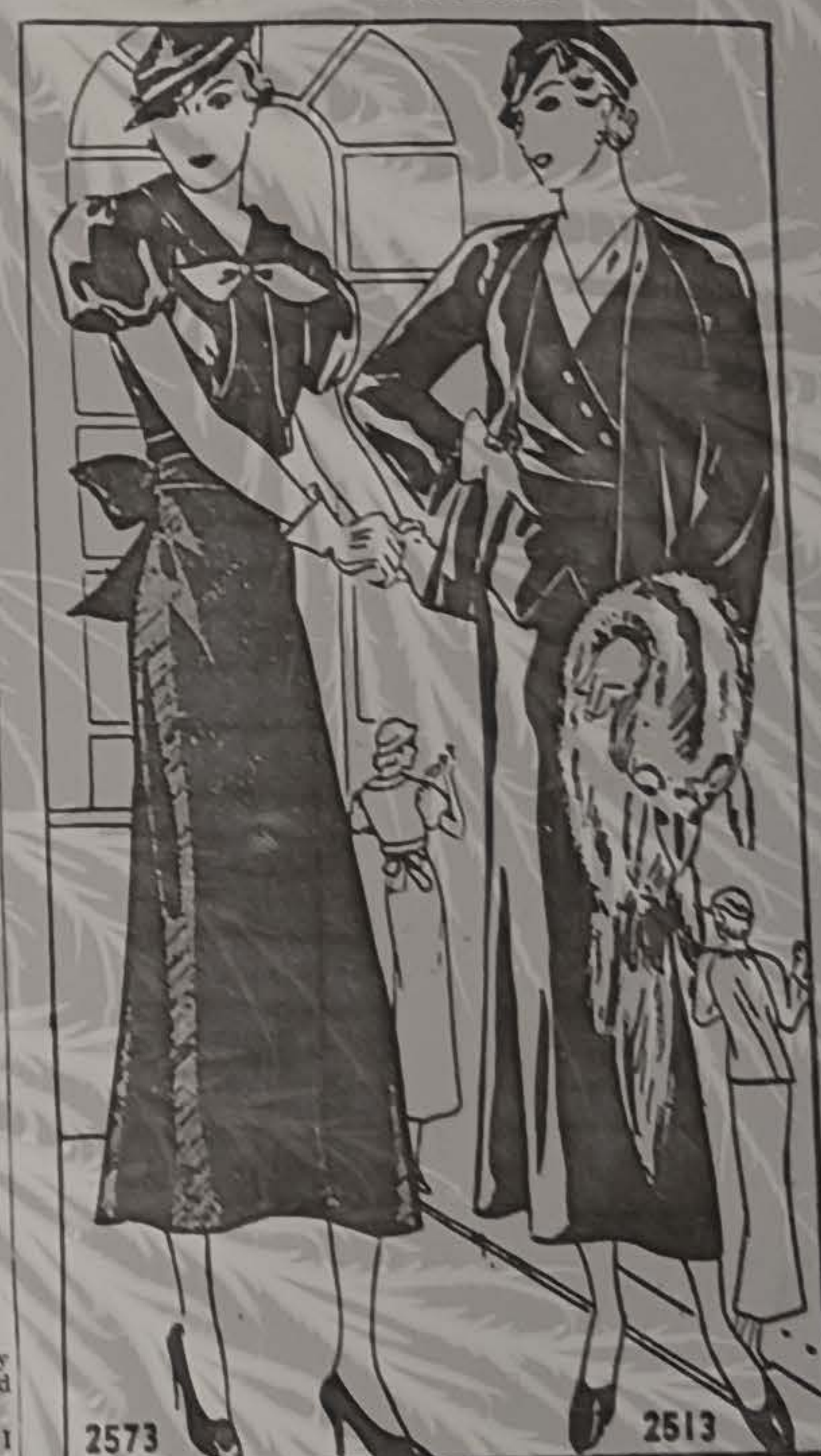
A newly opened paved route, Kansas City to Chicago, makes it possible to drive an automobile the entire distance in one day, at this route from Kansas City through Booneville, Columbia, Mexico and Leavenworth, has brought Chicago within 300 miles of Kansas City.

People traveling this route can visit the great University of Missouri, travel over the great upland, blue grass prairie of central Missouri, through Audrain county, with the greatest clay mines and fire brick plants in the world; through historical Bowling Green, the home of Champ Clark and the location of the magnificent monument to this great statesman; through the greatest nurseries in the world in Pike county and across three of the great rivers of the Mississippi valley, the Missouri river, the Mississippi river and the Illinois river.

An alternative route from Kansas City would be over U. S. 30 through Sedalia, the Missouri state fair grounds to Jefferson City.

Another newly opened route across Missouri from the Southwest comes through Springfield and the famous Ozark hills, over the great Bagnell dam and the Lake of the Ozarks, the largest artificial fresh water lake in the world, and on through the state capital to join the above route at Kingdom City.

Journal-Post Pattern



2573

2513

You'll need at least one satin dainty vest. Pattern 2573 is available in sizes 12, 14, 16, 18 and 20. Size 16 takes 4 yards 38-inch fabric. We've sketched two stunning models here. Both mother and daughter are favored. An adorable frock for the gay young miss has clever bodice seamings that simulate a tricky bolero. We dote on them! The sleeves and flattering collar are youthful and smart. If you choose satin for very best, use both dull and shiny sides. For school try it in contrasting colors. This ton prints, or in wool and silk. This captivating ensemble has been designed along slenderizing lines. Good news for the woman of manly proportions. The jacket is hip length with sleeves set in raglan fashion. Beneath is a frock equally charming that has undeniable chic with the surprise bodice, snug hip yoke and pointed skirt seaming. Contrast is used for a Pattern Department.

Tesla seems on the verge of something stupendous! —

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"I believe in plenty of exercise. I walk eight or ten miles every day, and never take a cab or other conveyance. Most of the harm and disease which comes from overeating and under-exercising, which brings about toxic conditions in the body and makes bath daily, for I think this is of importance. I take a warm bath, followed by a prolonged cold shower.

"Sleep? I scarcely ever sleep. I come of a long-lived family, but it is noted for its poor sleepers. I expect to match the records of my ancestors and live to be at least 100.

"MY SLEEPLESSNESS does not worry me. Sometimes I doze for an hour or so. Occasionally, however, once in a few months, I may sleep for four or five hours. Then I awaken virtually charged with energy, like a battery. Nothing can stop me after such a night's rest. I feel great strength then. There is no doubt about it but that sleep is a restorer, a vitalizer, that it in-

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"Today, at 77, I am energetic, withstanding, I have an excellent certificate of health. I never felt stronger in my life. I am energetic, strong, in full possession of all my mental faculties. In my prime I did not possess the energy I have today. And what is more, in solving my problems I use but a small part of the energy I possess. For I have learned how to conserve it. Because of my experience and knowledge gained through the years, my tasks are much lighter. Contrary to general belief, work comes easier for older people if they are in good health, because they have learned through years of practice how to arrive at a given place by the shortest path.

Chicago, 1933.

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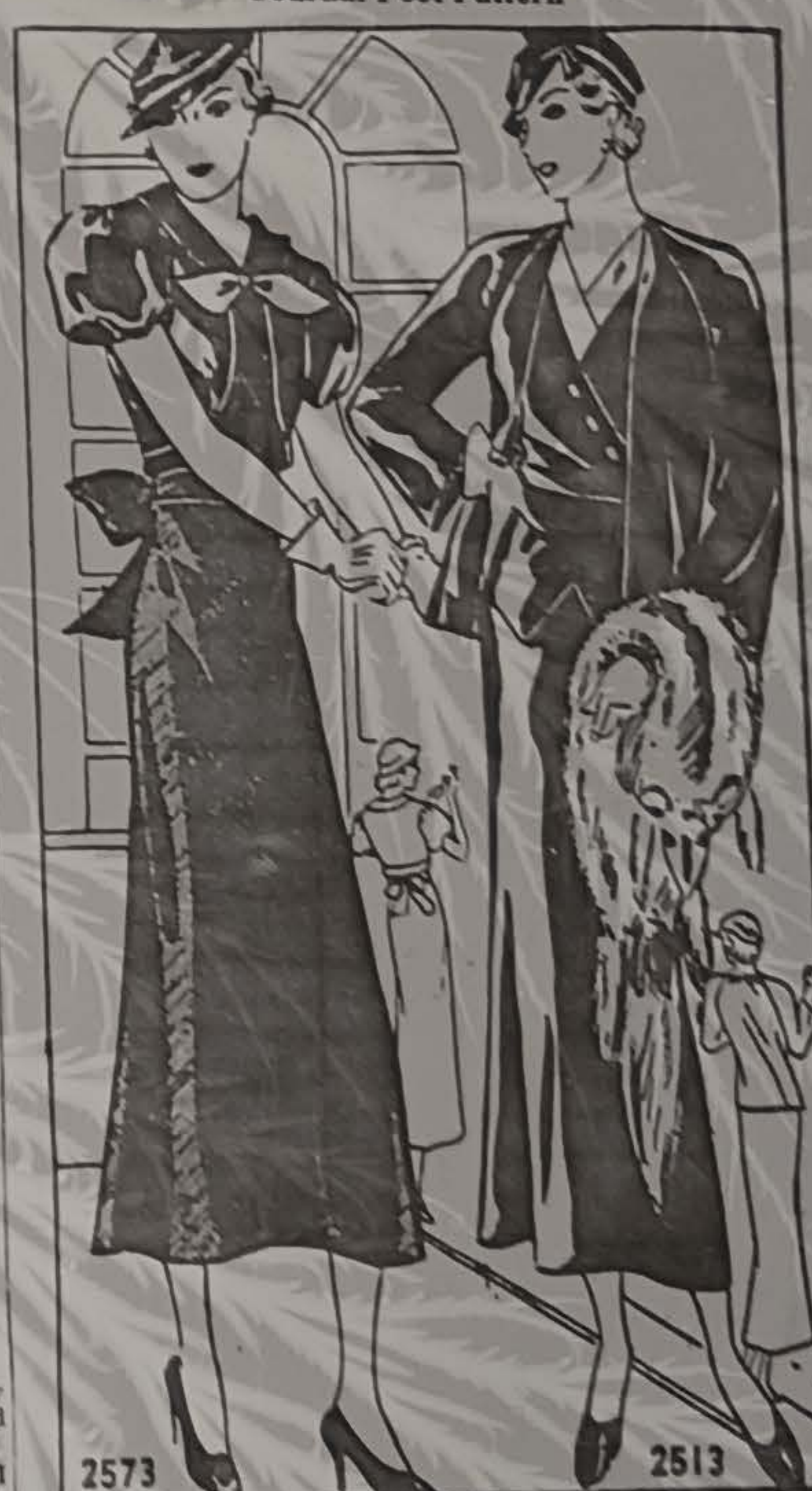
A newly opened paved route, Kansas City to Chicago, makes it possible to drive an automobile the entire distance in one day, at this route from Kansas City through Booneville, Columbia, Mexico and Leavenworth, has brought Chicago within 300 miles of Kansas City.

People traveling this route can visit the great University of Missouri, travel over the great upland, blue grass prairie of central Missouri, through Audrain county, with the greatest clay mines and fire brick plants in the world; through historical Bowling Green, the home of Champ Clark and the location of the magnificent monument to this great statesman; through the greatest nurseries in the world in Pike county and across three of the great rivers of the Mississippi valley, the Missouri river, the Mississippi river and the Illinois river.

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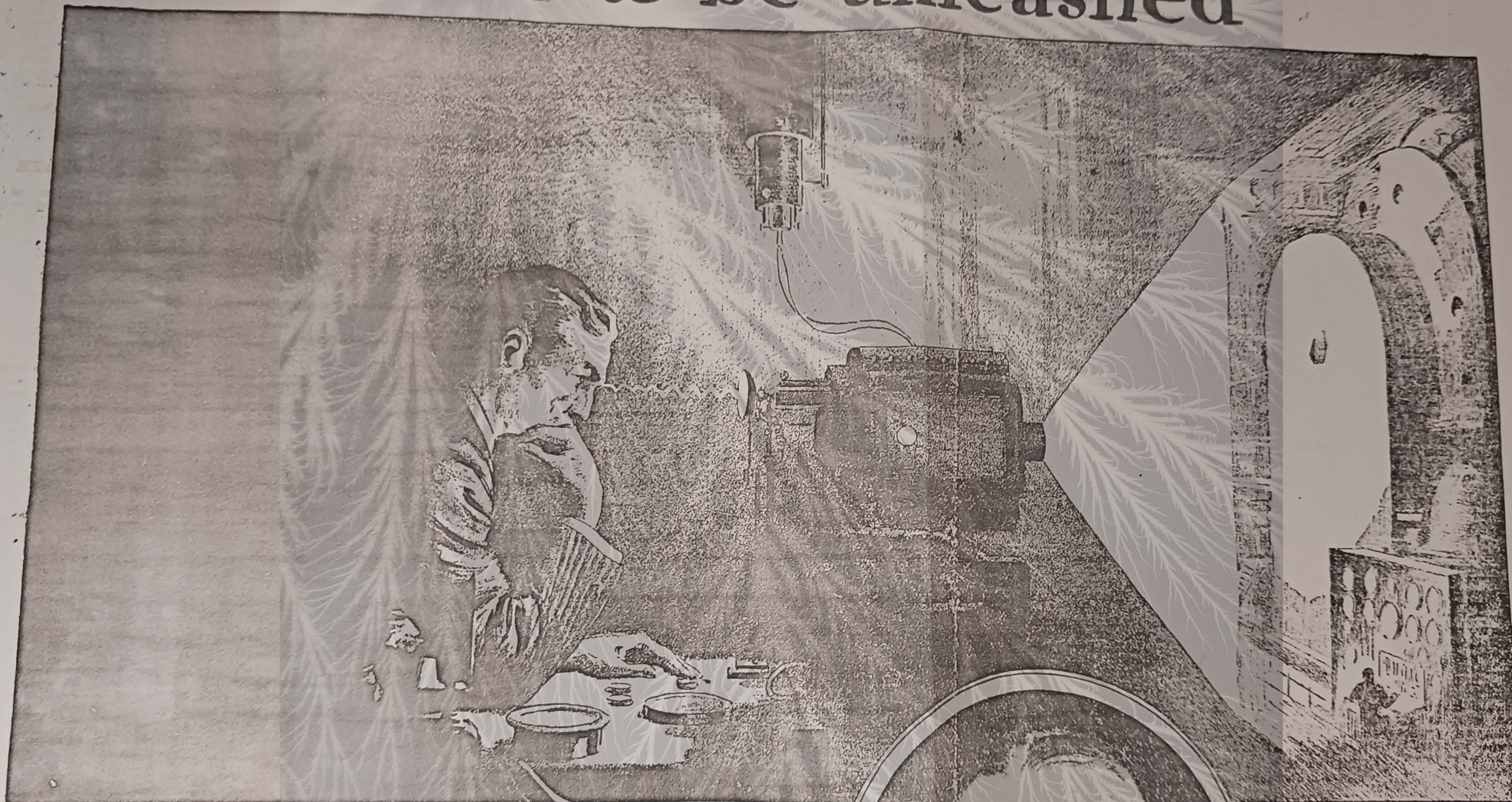
Tesla seems on the verge of something stupendous! —

SUNDAY, SEPTEMBER 10, 1933.

KANSAS CITY JOURNAL-POST.

PHONE MAIN 4000

Tremendous NEW POWER soon to be unleashed



By CAROL BIRD.

PROVING his theory that a man's efficiency and accomplishments should increase, and not diminish with mellow age, Nikola Tesla, inventor, physicist and one of the world's leading electrical technicians, enters his seventy-eighth year busily engaged on three or four great scientific projects.

Several of these inventions or discoveries will be looked upon as "miracles" by many people, for Mr. Tesla has long been a scientist

Nikola Tesla, Starting His 78th Year, Works on Revolutionary Power Project and

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Copyright, 1933

MANY NEW ROUTES OPENED ACROSS

Fortunately for the state of Missouri, this Chicago world's fair project of a state highway department in the construction of highways has the tourist many interesting routes.

Thousands of tourists crossing Missouri will be interested in the path of the Chicago East.

Newly paved shorter routes make it possible for the tourist to visit many great interest that were previously inaccessible.

A newly opened route from Kansas City to Booneville, Columbia, Missouri, has been opened within 500 miles.

People traveling through Missouri, travel over the blue grass prairie, through the great fire brick plant, through the home of the location of the monument to this through the world in the three of the Mississippi river, the Mississippi Illinois river.

An alternative route through Sedalia, fair grounds.

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How does he tap both these deep wells? What is the secret of fine health, keen mind, unusual vitality and mental force at 77, the time of life when most men are sitting in the sun with shawls over their knees or, alas! lying beneath the sod?

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pave the way to an early grave. be eaten at least once a day. They contain valuable mineral salts and are neutralizing.

"First of all, we eat too much, but this we have heard said often before. And we eat the wrong kinds of foods and drink the wrong kind of liquids. Most of the harm is done by overeating and under-exercising, which bring about toxic conditions in the body and make it impossible for the system to throw off the accumulated poisons.

"My regime for the good life and my diet? Well, for one thing, I drink plenty of milk and water. "Why overburden the bodies that serve us? I eat but two meals a day, and I avoid all acid-producing foods. Almost everybody eats too many peas and beans and other foods containing uric acid and other poisons. I partake liberally of fresh vegetables, fish or meat sparingly, and rarely. Fish is reputed as fine brain food, but has a very strong acid reaction, as it contains a great deal of phosphorus. Acidity is by far the worst enemy to fight off in old age.

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Nikola Tesla, dean of American inventors, with numerous triumphs in electrical engineering behind him, as he looked on his 77th birthday, which he recently celebrated

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Tesla seems on the verge of something stupendous!

N.Y. Sun

July 10, 1933

TESLA CERTAIN OF HIS NEW POWER

Inventor Says Only Details Remain to Be Checked.

The closing of experiments which reveal the availability of a hitherto untapped reservoir of energy, to be developed through simple machines which will last 500 years, was announced today by Nikola Tesla, inventor and physicist. Mr. Tesla chose his seventy-seventh birthday for his announcement, which was in reality an amplification of an announcement first made on his seventy-fifth.

Even now, however, details remain to be checked before the findings may be published and the source of the power revealed. Mr. Tesla has, however, completed and checked the basic experiments, he says, and feels able to announce as a certainty what he would indicate two years ago as only a probability.

He characterized his discovery as "so basic that it will undo the Einstein theory of relativity." The machines will be simpler than "any machines ever invented for the production of power." He added that the initial costs of the machines would be relatively large, but that they would be, for the practical purposes of short-lived man, everlasting. After installation, the machines will cost almost nothing for operation, he added. "There will be unlimited power almost for the asking."

He said, however, that he expected to be considered crazy. "They called me crazy in 1896 when I announced the discovery of cosmic rays," he said. "Again and again they jeered when I discovered something new and then years later saw that I was right."

Mr. Tesla at one time worked with Thomas A. Edison. He is accepted as one of the world's outstanding electrical technicians, who had contributed much of the research on which the practical application of radio is based.

Drowns in Midstream As Companions Lo

ST. LOUIS, July 10 (A. —) — Four of ten men failed to return from a party on the Mississippi River yesterday. Arthur Bayles, 31, from St. Louis, and a party of nine arrived at a beach on the river yesterday. Bayles expressed a desire to go in swimming. He tried to dissuade him from entering the water until the others had put on their swimming suits.

Breaking away from his companions, he leaped into the water and struck out for the shore. As he neared the shore, he sank from view in the hands of his friends standing on the bank.

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To the Ladies!

By

PRINCESS ALEXANDRA KROPOTKIN

linguist, friend of the famous in Europe, and descendant of the first czar of Russia

(Reading time: 4 minutes 45 seconds.)

OUT on the sidewalk on sunny days, in front of a commercial hotel near the Pennsylvania Station, you can see a gaunt old gentleman walking up and down. He is head and shoulders above the New York crowd. He is a giant.

Dr. Nikola Tesla is a giant in this town and time. During the greater part of this the greatest century in the inventive life of mankind, Dr. Tesla has worked and discovered and thought among the foremost.



Nikola Tesla

He invented the arc light, developed the transmission of electric power without wires. He worked with Edison. His experiments in charging the human body with high-frequency currents (under certain specific conditions) have proved of inestimable value in medical practice.

"Some day," said Dr. Tesla, "we will all be using these so-called 'electrical baths' to cleanse our bodies of dust and dirt."

As I talked with Tesla his thoughts swept back over the centuries to man's first awareness of electricity.

"Moses had an instrument for storing electricity," Tesla told me. "It came from the Egyptians, and it generated electricity from the friction of the wind blowing against curtains of silk."

We talked of Dr. Tesla's childhood; of his Serbian parents; of Smiljan—Place of Flowers—where he was born.

The vividness of his memory amazed me. Dr. Tesla remembers everything he ever has done or seen or heard throughout his long and eventful life. Incidents which occurred when he was two years old are as clear to him as those of yesterday, and he remembers word for word the text of books read in childhood.

Vision, a tremendous capacity for observation, intense interest in all the manifestations of creation—these are Dr. Tesla's, and with them a grave and courtly kindness.

AMONG the new books I like particularly Martha Ostenso's Prologue to Love. The rugged northern country of British Columbia interested me and the strength of the story is unusual, I thought. (Published by Dodd, Mead.)

SOME days ago a determined lady—she is socially prominent and very active in charity work—attempted to prove to me that everyone was much happier in the Middle Ages than most of us are today.

Since I talked with the determined lady I have come upon some rules that were in force at a rich English monastery of medieval times.

"A bath should by no means be refused to a body when compelled thereto by the needs of ill health. . . .

Should a brother wish for one when not advantageous, his desire is not to be gratified."

That was one of the rules. I wonder how the determined lady would like being compelled to forgo the bathing privileges of our kindly civilization? I wonder how she would like to wear the towering hair arrangement of the eighteenth century—and take her hair down only once a month?

Not for me! I prefer to live in 1932.

DO you remember the days when children were encouraged to collect flowers, ferns, and leaves, to press them and save them, and to pin them on sheets of thick paper with a neat description of each specimen written in a corner?

These childhood herbariums were beautiful and instructive. I had, I remember, a fine collection of dried seaweeds. Our trend today is all toward professionalism. Collecting leaves and plants is too often dismissed as leading nowhere.

Yet the road that seems to wander nowhere has a way, at times, of leading to some unexpected haven. For example:

Fifty women who learned how to preserve and classify plants when they were girls have just been given steady jobs at the New York Botanical Garden.

THE mole has burrowed its way back into favor. Moleskin is the fur of the year for our new "transformation" sets.

Wonderful things, these sets, and I am told that Scotch pelts are the best of the moleskins.

I saw one set consisting of a medium-sized moleskin collar with two fur scarf ends that could be attached to the collar or clipped on to a striped jersey scarf, and a small cape to be used with the collar or without. These combinations served in turn on two suits, two coats, and a cloth dress. I'll bet that set was made of Scotch mole. No other mole could inspire such thrift!

I MET a tall blonde at a recent tea party. I didn't hear her name. I judged her to be about thirty-five. "Mutton," said I to myself, "dressed as lamb."

A pancake hat perched on her curls—the way kids put their hats on sometimes when they are being funny. Her baby-blue dress clung too intimately to her figure, and she wore a large cheap-looking ornament at her throat—of imitation diamonds, I thought.

Half an hour later I learned her name. She was a much advertised beauty, a woman of great wealth. I realized that her diamonds were real but so ostentatious that they looked false.

And her actual age, I knew, was twenty-five, not thirty-five.

With just a little dignity and taste she would have looked a youthful twenty-five. Her foolish pursuit of schoolgirl "kiddishness" added ten years to her appearance.



Light

Former President G

PEOPLE in this country the economic situation business do not seem to be much better off than Cuba, as a case in point, is far worse off than an unresourceful government is economic crisis. Cuba at the summer of last year at Pinar del Rio; the soundest elements to power of former cal.

General Menocal, during his administration, was that admirable commercial business man of a high order of vision and gifts with vision. He is firmly of the opinion that the commercial losses of the last few years. The government and his policy, apparently, is too late. Cuba will be able to overcome difficulties, handicapped. It appears to persons that she will not be

Stimulus a

NIKOLA TESLA, the inventor of electricity, has a feeling, will eventually be comparable to the fluid which so civilization these days. The discovery, the details of the press, is coming. Shows the mechanical Dr. Tesla, in dealing a number of tun master fork. He told where all the other one of the smaller master fork into work vigorously and responded to the first room

INVENTION IN RETROSPECT.

In 1913 The Scientific American held a contest open to the world to determine what were "the ten greatest inventions of our time." Commercial importance was to be the criterion of greatness, and by "our time" the preceding twenty-five years was meant. One of those who participated was MR. WILLIAM J. WYMAN, who, as a Patent Office examiner, was in a peculiarly favorable position to appraise inventions. In The Journal of the Patent Office Society Mr. WYMAN now looks back at his list of nearly two decades ago and judges himself.

The ten inventions selected by him in 1913 were the electric furnace which reduced the price of aluminum from \$12 to 25 cents a pound; the steam turbine, which even then was driving ships at unprecedented speeds and generating energy at unprecedented low costs; the automobile, which was changing the habits of the American people and restoring the highway to its old social and economic importance; moving pictures; the airplane, which realized a dream as old as man; wireless communication, which was intangibly linking ships to their ports and colonies to their mother countries; the cyanide process, which trebled the output of gold; the induction motor of TESLA, which made it possible for alternating current, transmitted over long dis-

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Light on the Cuban Situation

Former President General Mario G. Menocal Stresses Short-Sighted Policy of Present Administration

PEOPLE in this country who chronically complain of the economic situation and sub-normal conditions of business do not seem to realize that, in actual fact, we are much better off than the rest of the world.

Cuba, as a case in point, near enough for Americans to study, is far worse off than we are. Due to a short-sighted and unresourceful government, Cuba has drifted into a serious economic crisis. Cuba had her chance in the latter part of the summer of last year, but lost it on the 13th of August at Pinar del Rio; although in the opinion of experts the soundest elements in the nation favored the return to power of former President General Mario G. Menocal.

General Menocal, during his administration, proved himself to be that admirable combination in a chief executive, —a business man of a high order as well as a political leader gifted with vision and judgment. Qualified observers are firmly of the opinion that he could have saved Cuba the commercial losses which she has sustained during the past few years. The best minds of the country favored him and his policy and still do; but the reigning machine, apparently, is too strong to be broken as yet. Whether Cuba will be able to work herself out of her present difficulties, handicapped as she is, remains to be seen. It appears to persons in a position to speak with authority that she will not be able to do so. At any rate,

her return to comparative prosperity can be expedited only through a change of administration.

The short-sightedness characteristic of the present government manifested itself recently in its advocacy of a grant of a 40-year monopoly on the sale of oil and gasoline in Cuba in exchange for the payment of Cuba's national debt. General Menocal opposes such a scheme on the ground that it is unconstitutional and would be a bad business deal. His intimate knowledge of the resources of his country enables him to estimate the probable value to the government of the oil deposits for the next 40 years at \$300,000,000, whereas the national debt is only \$200,000,000. Thus the Cuban Congress is detected in the act of throwing away the huge sum of \$100,000,000 merely as a political move designed to appeal to the more short-sighted members of the body politic.

"No future government of Cuba would recognize such an agreement," General Menocal declared, "but would, doubtless, annul such a monopoly." The tax on gasoline, General Menocal observed, yields about \$12,000,000 a year. General Menocal said that Oscar Cintas, who is soon to be Cuban Ambassador to the United States, had been in Wall Street for several days trying to negotiate the oil monopoly agreement.

Such mis-steps as this would be avoided under an administration concerned with the true welfare of the nation and not solely with questions of political expediency.

Stimulus and Response

DR. NIKOLA TESLA, who contributed the basic inventions which made possible the commercial development of electricity, has hit upon another discovery which, we feel, will eventually benefit the human race in a manner comparable to the benefits derived from the mysterious fluid which so thoroughly permeates all centers of civilization these days.

This discovery, the details of which were only recently released to the press, is comprised in a simple experiment which shows the mechanical nature of the function of memory. Dr. Tesla, in demonstrating this experiment, arranged a number of tuning-forks at equal distances around a master fork. He then activated the master fork to the point where all the other forks responded to it. He then selected one of the smaller forks at random, and taking it and the master fork into another room, he excited the master fork vigorously and for a long time, while the selected fork responded to it. He then returned with both forks to the first room and, placing the two back in their respective former positions, began gently exciting the master fork until only one fork responded—and that was the one he had chosen at random and treated to prolonged exposure to the vibratory waves of the master fork.

This experiment proves that the function of memory is mechanical and it opens avenues of investigation which seem to us to lead straight to the heart of the question of evolutionary processes in nature. The conditioning of an organism or of insensate atomic structures of any kind to repeated impressions obviously brings about some mys-

"Speak the Language Trippingly on the Tongue"

Try this on your ukulele: A bitter biting bittern bit a better biting bittern, and the bitten bittern bit the bitter bittern back, and the bitter bittern bitten by the better biting bittern is now a bitter biting bittern bitten back.—U. S. S. Breeze Kidder.

Tight-Wads

It's little use! New Jersey elected an "economy Legislature," and then the members voted themselves \$51 de luxe swivel chairs and \$24 card tables.—*Minneapolis Journal*.

terious change in that organism or structure which facilitates its absorption of repeated impressions of the same nature and renders it more susceptible to them. This law has long been recognized by physicists as it is borne out in the evolutionary processes among organic bodies, but the demonstration that it exists in insensate matter not only proves its existence in the former, but offers a readily accessible and demonstrable avenue for experimentation and research.

The human race owes Dr. Tesla a debt from which it will never be absolved, already; but we feel that the simple experiment which he has completed will result in immeasurably increasing that debt, and we hope that his keen intelligence is brought to bear on the continued investigation of the phenomena which it has opened up.

Value of Certain 'Super'

Pioneer Radio Engineer Gives Views on Power

Tesla Says Wireless Waves Are Not Electromagnetic, but Sound in Nature

Holds Space Not Curved

Predicts Power Transmission to Other Planets

By Nikola Tesla

The assumption of the Maxwellian ether was thought necessary to explain the propagation of light by transverse vibrations, which can only occur in a solid. So fascinating was this theory that even at present it has many supporters, despite the manifest impossibility of a medium, perfectly mobile and tenuous to a degree inconceivable, and yet extremely rigid, like steel. As a result some illusory ideas have been formed and various phenomena erroneously interpreted. The so-called Hertz waves are still considered a reality proving that light is electrical in its nature, and also that the ether is capable of transmitting transverse vibration of frequencies however low. This view has become untenable since I showed that the universal medium is a gaseous body in which only longitudinal pulses can be propagated, involving alternating compressions and expansions similar to those produced by sound waves in the air. Thus, a wireless transmitter does not emit Hertz waves which are a myth, but sound waves in the ether, behaving in every respect like those in the air, except that, owing to the great elastic force and extremely small density of the medium, their speed is that of light.

Suggested Short Waves Early

Since waves of this kind are all the more penetrating, the shorter they are, I have urged the experts engaged in the commercial application of the wireless art to employ very short waves, but for a long time my suggestions were not heeded. Eventually, though, this was done, and gradually the wave lengths were reduced to but a few meters. Invariably it was found that these waves, just as those in the air, follow the curvature of the earth and bend around obstacles, a peculiarity exhibited to a much lesser degree by transverse vibrations in a solid. Recently, however, ultrashort waves have been experimented with and the fact that they also have the same property was hailed as a great discovery, offering the stupendous promise to make wireless transmission infinitely simpler and cheaper.

It is of interest to know what wireless experts have expected, knowing that waves a few meters long are transmitted clear to the antipodes. Is there any reason that they would behave radically different when their length is reduced to about half of one meter?

Waves Go Around World

As the general knowledge of this subject seems very limited, I may state, that even waves only one or two millimeters long, which I produced thirty-three years ago, provided that they carry sufficient energy, can be transmitted around the globe. This is not so much due to refraction and reflection as to the properties of a gaseous medium and certain peculiar action which I shall explain some time in the future. At present it may be

New Columbia Extension Traces History of

850 Subjects Included in Di Evening Students May Obtain Degree in Accounting Department

A six-year course in accounting which will enable evening students to gain a bachelor's degree in place of the certificate now issued to the graduates of the four-year course will be inaugurated this fall in the University Extension at Columbia. Professor James C. Egbert, director, announced yesterday.

The change is being made, according to Professor Egbert, to meet with the new requirement of New York State law that after January 1, 1933, "every candidate for examination as a certified public accountant shall present evidence that he has satisfactorily completed the course of study in a college or school of accountancy registered by the department as maintaining a satisfactory standard."

The 1932-'33 program of the Columbia extension which will enter its twenty-second year as a university undertaking, includes 850 courses, among which will be a series of studies in the history of philosophy based on the "public courses" of the universities of France, to be under the supervision of the leading members of the Columbia faculty of philosophy.

During the coming year, students will be enabled to follow their various lines of study at the Seth Low Junior

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so-called three-electrode tubes. This invention has been credited to others, but as a matter of fact, it was brought out by me in 1892, the principle being described and illustrated in my lecture before the Franklin Institute and National Electric Light Association. In my original device I put around the incandescent filament a conducting member, which I called a "sleeve." This device is connected to a wire leading outside of the bulb and serves to modify the stream of particles projected from the filament according to the charge imparted to it. In this manner a new kind of detector, rectifier and amplifier was provided. Many forms of tubes on this principle were constructed by me and various interesting effects obtained by their means shown to visitors in my laboratory from 1893 to 1899, when I undertook the erection of an experimental world-system wireless plant at Colorado Springs.

During the last thirty-two years these tubes have been made veritable marvels of mechanical perfection, but while helpful in many ways, they have drawn the experts away from the simpler and much superior arrangement which I attempted to introduce in 1901. My plans involved the use of a highly effective and efficient transmitter conveying to any receiver at whatever distance, a relatively large amount of energy. The receiver is itself a device of elementary simplicity partaking of the characteristics of the ear, except that it is immensely more sensitive. In such a system resonant amplification is the only one necessary and the selectivity is so great that any desired number of separate channels can be provided without going to waves shorter than a few meters.

For this reason, and because of other shortcomings, I do not attach much importance to the employment of waves which are now being experimented with. Besides, I am contemplating the practical use of another principle, which I have discovered and which is almost unlimited in the number of channels and in the energy three-electrode tubes. This invention

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As the general knowledge of this subject seems very limited, I may state, that even waves only one or two millimeters long, which I produced thirty-three years ago, provided that they carry sufficient energy, can be transmitted around the globe. This is not so much due to refraction and reflection as to the properties of a gaseous medium and certain peculiar action which I shall explain some time in the future. At present it may be sufficient to call attention to an important fact in this connection, namely, that this bending of the beam projected from a reflector does not affect in the least its behavior in other respects. As regards deflection in a horizontal plane, it acts just as though it were straight. To be explicit the horizontal deviations are comparatively slight. In a proposed ultrashort wave transmission, the vertical bending, far from being an advantage, is a serious drawback, as it increases greatly the liability of disturbance by obstacles at the earth's surface. The downward deflection always occurs, irrespective of wave length, and also if the beam is thrown upward at an angle to the horizontal, and this tendency is, according to my finding, all the more pronounced the bigger the planet. On a body as large as the sun, it would be impossible to project a disturbance of this kind to any considerable distance except along the surface.

It might be inferred that I am alluding to the curvature of space supposed to exist according to the teachings of relativity, but nothing could be further from my mind. I hold that space cannot be curved, for the simple reason that it can have no properties. It might as well be said that God has properties. He has not, but only attributes and these are of our own making. Of properties we can only speak when dealing with matter filling the space. To say that in the presence of large bodies space becomes curved, is equivalent to stating that something can act upon nothing. I, for one, refuse to subscribe to such a view.

Need Radio Channels

The chief object of employing very short waves is to provide an increased number of channels required to satisfy the ever-growing demand for wireless appliances. But this is only because the transmitting and receiving apparatus, as generally employed, is ill-conceived and not well adapted for selection. The transmitter generates several systems of waves, all of which, except one, are useless. As a consequence, only an infinitesimal amount of energy reaches the receiver and dependence is placed on extreme amplification, which can be easily effected by the use of the

table marvels of mechanical perfection, but while helpful in many ways, they have drawn the experts away from the simpler and much superior arrangement which I attempted to introduce in 1901. My plans involved the use of a highly effective and efficient transmitter conveying to any receiver at whatever distance, a relatively large amount of energy. The receiver is itself a device of elementary simplicity partaking of the characteristics of the ear, except that it is immensely more sensitive. In such a system resonant amplification is the only one necessary and the selectivity is so great that any desired number of separate channels can be provided without going to waves shorter than a few meters.

For this reason, and because of other shortcomings, I do not attach much importance to the employment of waves which are now being experimented with. Besides, I am contemplating the practical use of another principle, which I have discovered and which is almost unlimited in the number of channels and in the energy three-electrode tubes. This invention has been credited to others, but as a matter of fact, it was brought out by me in 1892, the principle being transmitted. It should enable us to obtain many important results heretofore considered impossible. With the knowledge of the facts before me, I do not think it hazardous to predict that we will be enabled to illuminate the whole sky at night and that eventually we will flash power in virtually unlimited amounts to planets. It would not surprise me at all if an experiment to transmit thousands of horsepower to the moon by this new method were made in a few years from now.

Gramophone Records Pictures, Swiss Tells French Academy

PARIS, Sept. 10 (A).—A Swiss scientist from Geneva, whose name is given as Dussaud, has sent the French Academy of Sciences a paper in which he says he has invented a new system of television.

His system, he said, is based on the principle of registering pictures electrically on gramophone records and reproducing them by means of an ordinary television apparatus.

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Sept 7 1932
AMERICAN—A Paper for People

ELECTRICITY'S VALUE CITED IN WAR ON CANCER

Scientist Declares Million
Volts Can Be Used Without
Discomfort to the Patient

Should cancer be treated with electric currents, with radium, or with the knife?

This question engaged attention of scientists and physicians attending the Eleventh Annual Congress of Physical Therapy at Hotel New Yorker yesterday.

Nicola Tesla, eminent in electrical research and sender of the first wireless message around the world, favors electric current treatments. He said:

"Radium emanations are always hazardous, being difficult to confine to the precise region under treatment."

EXPLAINS APPARATUS.

Tesla went on to explain how an apparatus in his laboratory, producing 80 million electrical oscillations in a second, could be used in cancer treatment.

"With it the body may be charged with a pressure of about one million volts, which may be borne without discomfort, although the same voltage would cause explosion of a piece of metal."

Doctors Harold Swanberg and Arthur E. Perley, differing with Tesla, favored radium in cancer treatment. Dr. Swanberg said:

"One nationally known clinic has found that over 60 per cent are cured if the patients present themselves while the disease is in the early stages. Even in the more advanced stages, 12 per cent are cured by radium."

ADVOCATES KNIFE.

Dr. Edward H. Trowbridge, speaking before a special conference on surgery, advocated the knife in cancer treatment, but a new sort of knife, operated by electricity. He said:

"This knife makes it possible to operate in cancer cases before considered hopeless. An electrical current emanating from the tip of the knife does the actual cutting, and in the process it also stops bleeding and seals up nerve-tips."

Other noted physicians who spoke were Dr. Frank H. Krusen, associate dean of Temple University School of Medicine, Philadelphia; Dr. Allen T. Newman, dean of New York University College of Dentistry, and Dr. Charles F. McCarthy, director of physical therapy, New York City Department of Hospitals.



Ultra-Short Radio Waves Bent By Marconi in Test for Vatican

Discovery Permitting Transmission to Overcome Curvature of Earth Is Expected by Experts to Revolutionize Air Communication

By The Associated Press

ROME, Aug. 13.—Guglielmo Marconi has made another advance in the science of radio communication, he disclosed today, by "bending" ultra-short radio waves, which heretofore he had been unable to transmit through obstacles.

From his yacht Elettra, in the Gulf of Aranci, Island of Sardinia, he sent word to his collaborator, Marchese Luigi Solari, that messages had been dispatched successfully on fifty-seven-centimeter waves from Rocca di Papa, south of Rome, across the Tyrrhenian Sea to Cape Figaro, in the Gulf of Aranci, a distance of 270 kilometers (168 miles). Portable reflectors were used, communicating clearly both by radio telegraph and radio telephone.

Today's discovery permits transmission on ultra-short waves in such a manner as to overcome the earth's curvature. This, said Senator Marconi, is proof that the ultra-short wave is not definitely limited by all obstacles.

His associates attributed great importance to the discovery because heretofore it had been possible to use ultra-short wave communication only between two points in a line of vision.

The waves would not pass through houses, trees and similar objects. Senator Marconi has been trying for a year to "bend" the waves.

Experts here said that if he had overcome the obstacle of the earth's curvature he could overcome other obstacles, thus greatly extending the possibilities of ultra-short wave communication. This method, they said, eventually would revolutionize radio transmission, for it is infinitely cheaper and simpler than methods in use at present.

The inventor has been pushing his experiments recently to apply them in a first installation for Pope Pius XI between the Vatican and the papal summer home at Castel Gandolfo.

May Effect Economies, Experts Say

New York broadcasting engineers expressed great interest yesterday in Senator Marconi's achievement. One said that his development might make possible great economies in transmission and avoid interference among thousands of stations.

A. B. Chamberlain, chief engineer of the Columbia Broadcasting System, said: "Until now, utilization of the ultra-high-frequency band of radio

(Continued on page fifteen) C-5

Marconi Bends Ultra-Short Radio Waves

(Continued from page one)

waves has been possible only between two points in a line of vision. If Marconi's discovery has been correctly interpreted in the press reports, an entirely new field of radio and television transmission has been opened up, economies in transmission by thousands of stations without interference.

Charles W. Horn, general engineer of the National Broadcasting Company and a pioneer in the development of international radio communication, who was formerly associated with Marconi, made the following comment: "If the press report correctly interprets Marconi's achievement, Mr. Marconi has done a wonderful thing, something not believed possible here-

before. It is also probable that he has developed some new principle unknown to other engineers. If this is true, the achievement ranks with the original development of wireless telegraphy."

Tesla Comments on Announcement

Nikola Tesla, famous electrical inventor and a pioneer in radio development, when asked about the feasibility of bending ultra-short electrical waves, said last night at his apartment at the Hotel Governor Clinton:

"That ultra-short waves can pass around obstacles such as presented by the spherical shape of the earth is nothing new. We are telephoning with short waves to the greatest terrestrial distance without difficulty. But this is only due to the fact that the ether or universal medium which transmits the waves is not a solid body as assumed by Maxwell and Hertz, but a gas just like any other gas except that it is of inconceivably greater tenuity. This was established by me in experiments I made with powerful high potential vacuum tubes in 1897.

"That the ether is a gas is most fortunate, for if it were a solid body, transmitting transverse oscillations, the signalling by short electrical waves would be very much circumscribed. As I have announced on previous occasions, I have experimented with waves from one to two millimeters

long, and I have found them still capable of affecting receivers at a considerable distance from the transmitting path. Furthermore, it is well known that short waves are reflected from the upper strata of the air, and this fact has been made use of in transmission to greater distances.

"Much work in this direction has been done by experts in this country. There is no particular advantage of using ultra-short waves, because they are less economical to produce and propagate, preponderantly in a straight line. For this and other reasons their practical use is of limited value.

"I believe, though, that in time we will discover chemical methods of producing very short electrical waves in an extremely cheap and simple manner, without my complicated apparatus, which their generation now requires. I have done some experimenting in that direction and am hopeful that either through my own efforts or those of others this problem may be solved. In which case a very simple and inexpensive apparatus, meeting the practical requirements, could be provided for general use.

"I regret very much that wireless exports throughout the world cling to the Hertzian theory and continue to build apparatus conformably to that idea instead of designing the transmitter for the transmission of sound waves, which would insure incomparably better results."

Declarations of Faith

—By Joseph Auslander—

NIKOLA TESLA, acknowledged dean of American inventors, in a recent interview on his seventy-sixth birthday, reaffirmed his faith in the recuperative vitality of our old universe and proclaimed his enthusiastic belief in the tremendous possibilities of the future with such vigor and such ringing confidence as to shame the cowardly croakings of our modern Cassandras.

Coming on the heels of John D. Rockefeller's robust testament to the world on the occasion of his ninety-third birthday, this exhibition of courage, industry and tenacity on the part of our elders should give us pause. We have endured a devastating plenty of professional pessimism. It is easy enough, Heaven knows, in time of general distress to cultivate a down-at-the-mouth attitude. It is, indeed, far easier than any declaration of faith.

* * *

WHEN Tesla, with a boyish exuberance that mocks his years, informs the world that he has had "a very successful year," it is in the best interest of the world to listen. "I have made two inventions," he continues, "among the most important of my life. When they are announced one will be like the hundred thousand trumpets of the Apocalypse. The other will be less sensational, but it, too, will be important. It will be like the shout with which Joshua's army brought down the walls of Jericho!"

When Rockefeller asserts his unwavering adherence to "the fundamental principles upon which this country was founded—liberty, unselfish devotion to the common good and belief in God"—he is, it would appear, championing an unpopular credo. This talk of "liberty" and "unselfish devotion to the common good" is hardly calculated to sit well on an empty stomach. We can understand that. We can readily appreciate the cynical doubt which might well greet the catchword "liberty" in a land fettered to a vicious amendment. We cannot in all conscience blame that considerable portion of our people which has been betrayed and robbed and crucified by overlords whose "devotion to the common good" would warrant a strenuous use of the whipping post.

* * *

BUT these "fundamental principles" remain fundamental and true nevertheless. If anything, they are more fundamental, more true than they have ever been. That we have traduced these principles is unquestionable. And yet, as principles without which no democratic government can endure, they are not lightly to be dismissed. They were born out of blood and anguish and enormous travail. They will continue to exact a bitter price. But they are worth it.

"Let us," says Rockefeller, "as a nation, looking proudly to our past where it has been noble, and recognizing with humility our mistakes of extravagance, selfishness and indifference, let us, with faith in God, in ourselves and in humanity, go forward, courageously resolved to play our part worthily in building a better world."

* * *

IT is our profound conviction that both Tesla and Rockefeller will contribute mightily toward the building of that better world. It is our prayerful hope that they may live to enjoy the fruits of their building.

I have this idea years ago and it will be carried out in a much simpler way than here described.

•The ROCKET in the

The problem of making war effective has become that of destruction from the greatest distance. The rocket stands out as the most far-reaching potentiality for attack on a distant foe.

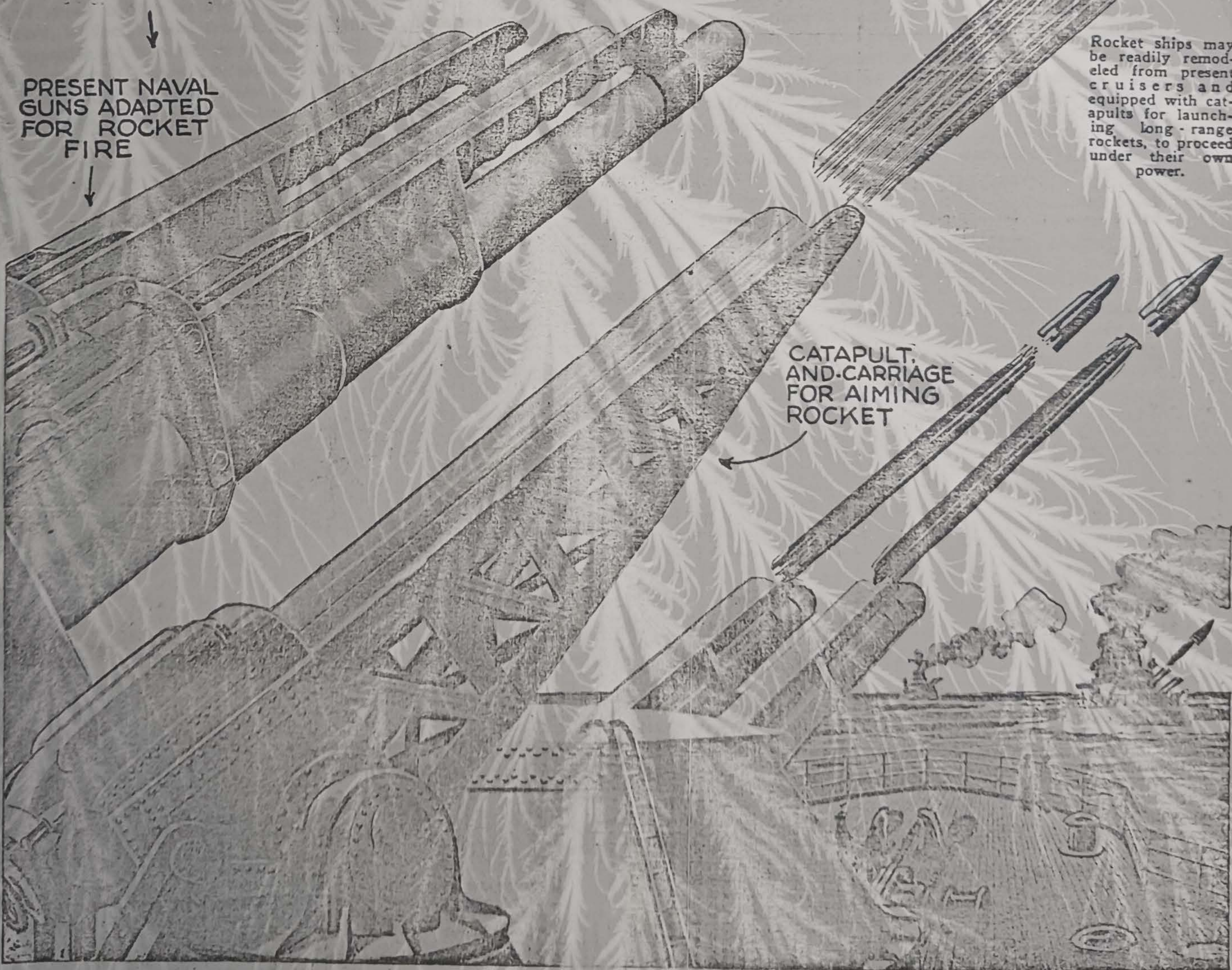
"THE whole nation will find itself on the firing line," said Marshal Foch, looking forward to "the next war." To understand how the rocket will dominate future conflicts, consider the question of destruction by long-range bombardment, one of the expedients of scientific militarists.

Assume that two nations are at war and their armies have been rushed to the frontier. The strategy of the new warfare will call for the prevention of an enemy invasion and, simultaneously, the destruction of the enemy's strategic centers by long-range shells.

Consider what this means. Long-range artillery, which previously has been used principally against opposing armies, at distances of five to twenty-five miles, must now be adapted to shoot shells 200 to 500 miles. It will be necessary, furthermore, to hit the distant targets aimed at; and to hit them often enough to complete the desired destruction. For this novel task, in my opinion, present artillery is entirely unfit and, were the success of future long-range bombardment to rest solely on artillery, one arm of the "destruction from a distance" program would surely fail. But luckily for the militarist, the rocket will supply him with the very instrumentality that he needs.

It is quite possible that, even were long-range guns constructed like mountains of steel, to withstand all the enormous strains of firing, and to give greatly increased velocities to the shells, they would yet fail to achieve the necessary ranges. For the enormous increase in the resistance of the air, at these great velocities, would reduce the speed of the shells so quickly as to minimize the effect of the added propulsive force. The additional energy imparted to a shell, to increase its muzzle velocity, might serve only to heat the casing by friction against the air, and add but little to its actual range.

This fundamental weakness of the present high-power artillery is in contrast with the effectiveness of the rocket-propelled shell as a means of effecting a long-distance bombardment. For the rocket can, first, propel shells to distances impossible with artillery; and, secondly could be shot in such numbers and with such rapidity as to constitute an avalanche of death from which there would be no escape.



1932

March, 1932

EVERYDAY SCIENCE AND MECHANICS

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next

WAR ?

By DAVID LASSER*

The rocket rises, gaining headway at each instant, under gyroscopic or other control of its flight, until it passes into a practically airless region; and finally descends hundreds of miles away.

The Rocket's Principle

IN simplest terms, the rocket consists of a chamber in which a fuel is burned (See Fig. 1) and the resultant expanding gases are expelled to the outside. The expansion and expulsion of the highly compressed gases causes a reaction or "kick" against the chamber walls that pushes the rocket ahead. This action is similar to the recoil of firearms; the "kick" of the weapon being the reaction to the force of expulsion of the shell.

The rocket carries its own fuel; and its motion continues until the fuel has been exhausted and the momentum lost.

If, to the rocket motor, there is attached a nose filled with high explosive, gas or anything deadly that modern science can create, there is created a self-propelling shell that should make possible the fondest dreams of the militarist.

Such projectiles would be gun and shell in one and, therefore, no heavy ordnance would be necessary to shoot them. It would merely be necessary to give them a start, and they would carry themselves hundreds of miles, to strike with stunning force.

Batteries, shooting rocket shells into the heart of an enemy country, could be built by the thousands, and fired with the rapidity of small calibre artillery.

The rocket, in fact, would travel through the air, in a manner just the opposite of that of an artillery shell. Where the long-range artillery shell leaves the gun at its maximum speed, encountering at once the great resistance of the lower air levels; the rocket would leave the mounting slowly, and acquire speed only as it shot upward into the high rarefied regions of the air, where the resistance is small.

Shooting upward, thirty to fifty miles above the earth in its

passage, the rocket shell would then drop with terrifying speed upon city or munition plant.

War to the Utmost

WHAT would this mean in an actual conflict? Scanning the map of Europe, we see that Paris could easily be shelled from the German border, and Berlin from the Rhine. London would be within range of both French and German shells; and little Switzerland, now a buffer state against the progress of opposing armies, might find itself arched by a rain of Italian and French rocket shells, hurled into enemy territory.

Each nation could devastate the other in a rain of death, from which there could be no relief. All of the creative and destructive facilities of man could be destroyed without a foot being set across an enemy border.

Let us imagine the effect of the rocket upon America, in its supposed isolation. An enemy fleet may start upon the invasion of America equipped with rocket batteries that shoot shells 200 miles or more. This is possible, since no heavy ordnance need be carried to shoot them. The fleet could anchor off our coast and reduce our forts to a mass of ruins. Our sixteen-inch coast-defense guns, with maximum ranges of 30 miles, would be toys, compared to the naval rocket batteries.

Boston, New York, Philadelphia, Baltimore and Washington could be reduced by an enemy fleet resting in safety in the Atlantic; or our Pacific ports might fall without a serious blow being struck.

For emphasis I record an editorial of the *New York Times*, of October 10, 1931, commenting upon the perfection of anti-aircraft guns. "What was to happen in the next war," said the *Times*, "has been described in terms calculated to frighten every nation out of its growth, if the predictions were taken without a thought of the means of protection. In such a vast convulsion the airplane would be the means of destruction. If a defense from the ground could be contrived countries would feel safer."

*President, American Interplanetary Society; author, "The Conquest of Space."



Against an invading fleet armed with long-range rockets, the heaviest of coast defense and naval guns might be as useless as clubs and spears. The extension of battle areas would be as revolutionary as in the days

of the production of the modern rifle and the airplane. Assaults would be directed upon known objectives, by map; just as in long-range artillery fire of today which is directed upon invisible targets.

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One of Norway's most
important newspa-
pers, Morgenbladet, re-
cently issued the first
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THAN BALTOR.
19, 1932.

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the world to one's own self and its
interests has to be overcome if sal-
vation for Europe with her bundle of
new States is to come. The ideas of
cooperation, service and leadership
of the able have to be endorsed so
that every nation should develop its
abilities and utilize them for the sake
of the whole Commonwealth. Then,
also, a re-evaluation of the nation
will be possible. Germany cooperat-
ing with Lithuania will not try to
Germanize the Lithuanians, for she
will see the value of Lithuanian
achievements, and that they finally
are to Germany's own advantage,
and vice versa. Such a cooperation
would not be new. I only recall the
fact that the Germans have done a
great piece of work in helping to
collect and edit the wonderful Lith-
uanian folksongs. Here we have an
honest exchange of the very best
achievements of two nations. Why
not throw away the narrow, national-
istic, individualistic viewpoint?

HANS DECKE.
Princeton, N. J., Feb. 19, 1932.

THE TESLA EXPERIMENTS.

Further Light Is Sought on Conclu-
sion Regarding the Cosmic Ray.

To the Editor of The New York Times:
In a recent letter to THE NEW
YORK TIMES Nikola Tesla recalled a
startling theory of the cosmic rays
and radioactivity which he claimed
to have discovered and announced
many years ago.

He says that in 1899 he "obtained
mathematical and experimental
proofs that the sun and other heav-
enly bodies, similarly conditioned,
emit rays of great energy which con-
sist of inconceivably small particles
animated by velocities vastly exceed-
ing the velocity of light."

He does not describe these experi-
ments and his references to their
previous publication is quite general
and not specific. Also he does not
tell us by what mathematical opera-
tions he analyzed the motion of par-
ticles moving with a velocity "vastly
exceeding the velocity of light."

These experiments and theories of
Mr. Tesla are entirely unknown to
physicists of the present time. I
have never seen any reference to
them in the literature of physics and
in the proceedings of scientific socie-
ties.

More than fifty years ago Sir J. J.
Thomson, the most distinguished
pupil of the great Maxwell, published
an essay in which he proved by the
electromagnetic theory of his great
teacher that no electrified particle
can move with a velocity equal to or
greater than that of light. The late
Professor Lorentz, by extending
Maxwell's electromagnetic theory,
obtained results that agree with
those of Sir J. J. Thomson. The
theory of Lorentz expressing the re-
lation between the mass and velocity
of moving charges forms a funda-
mental part of the special relativity
theory of Einstein.

The theory of Lorentz shows that
the mass of such particles will in-
crease as the velocity increases ac-
cording to a definite law, and at the
velocity of light the mass and en-
ergy of the particle will become in-
finite. Experiments on moving,
charged particles exactly confirm the
theory of Lorentz. Experiments
have been made with particles hav-
ing velocities greater than 99 per

proportion of our population does not
occur to the landlords' advocates.
Nor do they realize the social in-
decency of present efforts to per-
petuate wretched slum conditions
and fire hazards that should have
been outlawed long ago. If, for one,
hope that sufficient indignation will
be displayed here and in Albany to
make such impossible.

STANLEY M. ISAACS.
New York, Feb. 19, 1932.

Webster on Washington.
To the Editor of The New York Times:

It is just one hundred years since
Daniel Webster delivered his great
address on George Washington at
the centennial celebration in Wash-
ington. It seems to me many would
be interested in reading the last
paragraph:

"A hundred years hence, other
disciples of his will celebrate
his birth with no less sincere admi-
ration than we now commemorate
it. When we meet, as we now
meet, to honor him, they shall see the
blue sun rise in the sky whose
beams shall be the rays of his
life, and he shall be the one
still flowing in the sea, so
surely that we now see
the flag of his life on the
top of the mountain, then, as now,
may the people visit no
land more happy, more
lovely, than our own country!"

W. H. G. MORRISON.
Sharon, Pa., Feb. 15, 1932.

Information Sought.
To the Editor of The New York Times:

These may seem like queer ques-
tions; nevertheless, I should like to
ask them. When jobs are about as
scarce as teeth, and millions
of men, so it is told, have none
at all, why are there so many strikes
in progress, threatening for in-
creased wages among other things?

If it is again so low to litter side-
walks, why do members of the New
York police force walk so dandily
through oceans of litter instead of
demanding that persons whose prop-
erty adjoins the desecrated sidewalk
immediately clean it up?

After all, even in New York, is not
crime an occasional happening in
every neighborhood, while dirt, in the
form of litter, is always with us;
and, like the housewife's duties,
should street and sidewalk cleaning
not be a daily and hourly task?

OTHER QUESTIONS.
New York, Feb. 16, 1932.

Debits and Values.
To the Editor of The New York Times:

Since the dollar deals to the United
States were created, in 1916, 1917
and 1918, the commodity purchasing
power both of the dollar
has very greatly increased. To press
for payment at present prices
is as though one should weigh out ten
tons of flour to a friend, and then
ask him to pay back ten for ten after
an accident had greatly lengthened
one arm of the balance.

I venture to believe that there are
not many American citizens who, in
private life, would ask a debtor to
continue payments under such condi-
tions, until they had first set back
the fulcrum of the balance in its
original position.

K. WASHINGTON GRAY.
South Fersin, Jan. 24, 1932.

how its pocket is being plundered in
other ways. When a bitter partisan
investigation has as its chief inqual-
ity for the political enemy of the asso-
ciation which is charged with being
the sole offender, although he poses
as a Democrat, we who live in other
States wonder if such things as this
are not more harmful to the future
of the party than the strained at-
tempt to impute party wrecking to
Governor Smith's announcement. A
political housecleaning within the do-
main of one's party is all right and
proper, but when it is employed by
the Opposition the hope to profit by
the acts of the sinner would seem to
be more human in its object than the
profession of good faith in the public
service. HENRY BURT WARE.
Salem, N. J., Feb. 19, 1932.

The Saint Memin Miniature.
To the Editor of The New York Times:

Noticing that you feature as the
most prominent picture of Washing-
ton in THE TIMES Magazine today
an enlargement of the miniature by
Saint Memin, let me call your atten-
tion to the use of this portrait on
the 8-cent postage stamp of the
Washington commemorative issue re-
cently put out by the Postoffice.

In this connection, it may be of
interest to the public, and particu-
larly to stamp collectors, to know
that the selection of the Saint Memin
portrait was probably due in the
main to the recommendation of
Albert Rosenthal, the well-known
artist and expert on Colonial paint-
ings, at whose instance I wrote the
Postmaster General in January, 1931,
when it was assumed only one por-
trait would be chosen for the entire
series, citing it for his consideration.
In that letter I transmitted the sug-
gestion that the Saint Memin pos-
sessed unusual suitability for the
purpose, adding: "I am prompted to
write you by the fact that Albert
Rosenthal of this city, who ranks
among foremost authorities on origi-
nal Washington portraits, pro-
nounces this miniature the best of
its kind, requiring no reduction in
size and presenting the desirable
sharp profile view."

The official acknowledgment gave
assurance that the Saint Memin
drawing would be brought before the
committee having the decision in
hand. It was eventually determined
to reproduce twelve different por-
traits of Washington on stamps of
as many denominations among which
this one was included.

VICTOR ROSEWATER.
Philadelphia, Pa., Feb. 21, 1932.

A New Chief Judge Needed.
To the Editor of The New York Times:

The appointment of Judge Cardozo
to the United States Supreme Court
leaves vacant the post of Chief Judge
of the New York State Court of Ap-
peals. For this there is no man
superior in learning and the adminis-
tration of the law to Judge Cuthbert
W. Pound, at present on the Court
of Appeals bench. His colleagues of
the court and many other influential
citizens and bar associations are sup-
porting the movement for his promo-
tion. The judge is a Republican, but
the elevation of Judge Cardozo by
President Hoover demonstrates the
fact that political considerations
should not influence judicial appoint-
ments. I hope that Governor Roose-
velt will adopt the recommendations
made on behalf of Judge Pound and
promote him to the vacant position
for which he is pre-eminently suited.

SIDNEY B. PFEIFFER.
Buffalo, N. Y., Feb. 20, 1932.

FEBRUARY 24, 1932

Letters to the Editor

THE MEMEL SITUATION.

Nationalistic Viewpoint Held Opposed to Desired Accord.

To the Editor of The New York Times:

Vincent F. Jankauskas in a letter to THE NEW YORK TIMES makes some statements which I feel obliged to answer. He claims to state facts, and yet they are very disputable and partly obviously mistaken. A greater limitation of the word fact would seem advisable. I do not want to reply to the statement that Lithuania is entitled to sovereignty over Memel "ethnically, politically, economically and geographically," because that statement is a mere assertion of what should rather be proved.

According to Mr. Jankauskas only 40 per cent of the population of the Memel territory is German. Evidently he judges by language, because it is true that about 60 per cent use Lithuanian in their daily speech, although practically all know German. Yet, simply to call these people Lithuanians seems to be unjust, because they themselves are not at all sympathetic to Lithuania and evidently favor Germany. Why does Mr. Jankauskas conceal the fact that in 1921 90 per cent of the population voted against being annexed to Lithuania, and that in October, 1923, the relation of German and Lithuanian votes was more than ten to one? Why has the Lithuanian Government never dared frankly to arrange a plebiscite to let the Memelites themselves decide on their future? Was it not because they knew that the right is not on their side and that they would lose the valuable port of Memel if the right would be given away? It seems a more just consideration when THE NEW YORK TIMES on Feb. 14 calls the Memel case "one of the most flagrant violations of the principle of self-determination of peoples so eloquently advocated by Woodrow Wilson."

That during the Lithuanian rule no oppression of the German element was allowed is a mistaken idea. On the contrary, the promised autonomy of the territory was severely neglected. Especially the District Directory, which was formed by the Lithuanian Governor, has tried time and again to de-Germanize the population, which resulted in no Lithuanian success, but in endless quarrels with the population and the Parliament, who defended their right of autonomy.

I do not want to limit this reply to a mere negative criticism. It seems to me that Mr. Jankauskas has become a victim of the same individualistic and chauvinistic spirit which, in 1920, induced the Poles to invade the Lithuanian capital of Vilna, the rape of which later was legalized by the League. The spirit which limits the world to one's own self and its interests has to be overcome if salvation for Europe with her bundle of new States is to come. The ideas of cooperation, service and leadership of the able have to be endorsed so that every nation should develop its abilities and utilize them for the sake of the whole Commonwealth. Then, also, a re-evaluation of the nation will be possible. Germany cooperating with Lithuania will not try to Germanize the Lithuanians, for she will see the value of Lithuanian achievements, and that they finally are to Germany's own advantage, and vice versa. Such a cooperation would not be new. I only recall the fact that the Germans have done a great piece of work in helping to collect and edit the wonderful Lithuanian folksongs. Here we have an honest exchange of the very best achievements of two nations. Why

cent of that of light. The mass is found to be very large compared to the mass at small velocities. The mass increases enormously as the velocity approaches that of light. It would require an infinitely high voltage to give a particle the velocity of light.

Mr. Tesla maintains that his experiments and mathematical analysis prove the existence of particles moving with a velocity "vastly exceeding that of light." If this were true, it would invalidate not only Einstein's relativity theory, but also Maxwell's electromagnetic theory and its extension by Lorentz. In fact, it would invalidate the universally accepted results of modern physics. It is up to Mr. Tesla to convince the physicists that his experiments are valid and that his theory rests on solid ground.

BERGEN DAVIS.

Columbia University, Feb. 17, 1932.

The Dwellings Law.

To the Editor of The New York Times:

Once again it is necessary for those interested in decent housing conditions in the city of New York to go to Albany to withstand the annual drive against those sections of the dwellings law which require the owners of certain tenement houses to make them more safe for their occupants and living conditions in them somewhat more sanitary.

The dwellings law made rather mild requirements for greater safety against fire hazards. The law provided that the ceilings of cellars in which so large a percentage of fires start should be fire-retained so that many of the fires commencing there would be stifled at the source. It also required self-closing doors leading to the stairs to prevent or at least delay the spread of fire from the apartment in which it started. The cost of these changes is trifling and yet a group of landlords is resisting even these meager safeguards.

The dwellings law provides that toilets now in the yard, used in common by all of the tenants, should be replaced by at least one toilet for every two or in some cases three families and on alternate floors. This compromise, reluctantly accepted in at the time, also stated for postponement, if some landlords have their way.

After many years' hard fighting, the occupancy of damp, dark and unwholesome cellars was prohibited. Despite a larger number of vacancies in the upper floors of old law tenements than in any year since 1914, these same landlords are endeavoring to have an enforcement of even this provision of the law delayed.

Apparently the impolicy of taking advantage of conditions which have brought distress to such a huge proportion of our population does not occur to the landlords' advocates. Nor do they realize the social indecency of present efforts to perpetuate wretched slum conditions and fire hazards, which should have been outlawed long ago. I, for one, hope that sufficient indignation will be displayed here and in Albany to make success impossible.

STANLEY M. ISAACS.

New York, Feb. 19, 1932.

Washington on Washington.

To the Editor of The New York Times:

It is a hundred years since Daniel Webster delivered his great address in the United States Capitol at the celebration in Washington. I came to me many would be interested in reading the last paragraph.

"A hundred years hence, other disciples of Washington will celebrate the centennial of his birth."

POLITICAL HOUSECLEANING.

Its Efficacy Held to Depend Upon Who Does It.

To the Editor of The New York Times:

THE TIMES editorial "Through Farley at Tammany," although no doubt true in fact, cannot but serve to the injury of the Democratic party. It goes without saying that all political bodies in the large cities are in the business to keep alive their own peculiar institutions, and incidentally to lose no opportunity to add to their private fortunes. These methods are of many kinds, nearly all of which the fastidious-minded person in politics would hesitate to touch. It is evident that he has no place in the domain of practical politics.

But as a critic on the side lines, as an observer of political methods from the day of Robert Walpole to the present time, it can hardly be expected that the operators are content with the mere reward that is attached to honor and look disapprovingly on the sordid incidents of the inside workings of a government of the people. This condition of self-enrichment is incident in various ways from the highest to the lowest.

The methods resorted to by the smaller men in the machine are so reprehensible, and those who are higher up in the political world would not touch. At the same time place and environment give to them in the scale of the mighty the opportunity to become rich by the grace of the powerful political machine.

The criticism I make of your editorial as well as of the whole investigation is that such methods are not uniform and are inspired purely through partisan methods. It is a matter of common property that in Washington, as well as in all the large Northern cities, and in many instances, to a smaller degree, the less populated cities, graft occurs where opportunity presents itself.

It is not the politician alone who is responsible for this condition. It is not unusual for the business man to seize every chance to make money as part of his business, and he on his side, if a politician, takes an unfair advantage of his business rival by preventing competitive bidding for public contracts, he sees no harm, although from his committee meeting in the precinct, which he speaks with alarm over the incursions of practical politicians.

Knowing this, why is Tammany exploited as the only evil? For the simple reason that a party growing the loss of preference as the result of coming elections seeks to divert the citizen to gaze on Tammany and its works, and the public will forget how its pocket is being plundered in other ways. When a bitter partisan investigation has as its chief object the political enemy of the association which is charged with being the sole offender, although he is, as a Democrat, we who live in other States wonder if such things as this are not more harmful to the future of the party than the strained attempt to impute party wrecking to Governor Smith's announcement. A political housecleaning within the domain of one's party is all right and proper, but when it is employed by the acts of the slinner would seem to be more human in its object than the profession of good faith in the public service. HENRY BURT WARE.

Salem, N. J., Feb. 19, 1932.

The Saint Memin Miniature.

To the Editor of The New York Times:

Noticing that you feature as the

alles. More than 500 photographs were taken and were supplemented by more than 700 others from heights of land and the by the method of "from the air," devised by the American Society, will make possible map of the whole soundings were also

of Labrador must be in ships passing from Northwest through the charting will a geographical but an

Patrick's Day comes weeks from tomorrow and normally would mark the opening of the season. Even in the the Olympic Winter failure for lack of about this city the act has been the boy sled as a Christmas not been able to get it. There have been but no storm calling and the shovel.

a benignant Winter. SCARR warns of much and who knows that ed snowstorm is not yet? The Great Blizzard of the calendar indicator was almost over. resembled the present wary was well on was Look over the record 5th and you will find temperatures below 20 degrees sleet and snow.

re has until now been peak of. As this week signs were all of early migrating Winter gone South, and on crocuses were break-

When the reader of a mystery story throws down the book with the remark, "Well, I knew from the beginning the crime," the failure. No such comfort brought against the story now appearing London Morning Post. Written by Post readers each installment by a man, and not even the slightest notion who

of 4,000 names "Xenophobia" selected as the slouch the criminal. Eight one mystery murders for him to try his of these "Le Pauvre Neige Boiteux" was phon Ray's task is to "The Limping Snow" who killed him. The r finds him kneeling Fontainebleau looking

composite defective the wholesale producer. Each competitor who of it, if he plays fair, mind a possible solution the writer of the final will have the hardest ng to a logical conclusion implications spun out

One of Norway's most important newspapers, Morgenbladet, recently issued the first index to its news. It is the first of its kind in the Continent and has, Miss MANSFIELD, been named after the Anglo-

Elaborate Ceremonies

Nikola Tesla Tells of New Radio Theories

Does Not Believe in Hertz Waves and Heavyside Layer, Interview Discloses

The model of a "Tesla Coil" which will be featured in the historical exhibit of the radio show reawakens interest in its inventor.

It is not generally appreciated that this curious apparatus, often associated merely with pretty or spectacular demonstrations of high voltage electricity, is really a fundamental part of modern radio. For all the tuning apparatus and circuits in every transmitting and receiving set are simply variations of Tesla coils and Tesla coil circuits.

It was for this invention, and other inventions and principles concerned with tuning, heterodyning, and the generation of continuous waves, which were made at least several years before the very first experiments of Marconi, that many of our most reputable engineers have conceded to Nikola Tesla the title of "Father of Radio."

Mr. Tesla, still actively working, was interviewed last week to get his ideas regarding the prospects of the radio of 1930, and beyond. As a prophet, however, he balked. He had repeated time and again his visions for the future. As far back as 1900, he had contemplated a world-wireless system which included broadcasting, picture transmission, international time service, and in addition television and the distribution of electrical power. Part of this early prophecy has been realized—what remained, still stood as his prediction.

Disputes Hertz Waves

What, then, about power transmission by radio? Laurence M. Cockaday, the technical editor of this radio section, had expressed the opinion several weeks ago that, with present apparatus at least, it was hardly feasible. Mr. Tesla agreed to discuss the point at length. As a result, he made public for the first time one of his most extraordinary conclusions—that Hertz waves do not exist! If his theory is true, there may be found in it more adequate explanations of "dead spots," fading, reflection and a dozen other problems that have always puzzled the profession.

The inventor began by referring to Cockaday's article:

"I have read the article, and I quite agree with the opinion expressed—that wireless power transmission is impractical with present apparatus. This conclusion will be naturally reached by any one who recognizes the nature of the agent by which the impulses are transmitted in present wireless practice. When Dr. Heinrich Hertz undertook

(Continued on page twenty-one)

Nearly 300 Manufacturers to Show Latest Models of Sets and Accessories Monday at 2 P. M.

\$300,000 Broadcast Bill on Networks

Leading Artists to Appear in Costume Before Television and Microphones

By Lloyd Jacquet

TO that ever-increasing group of persons who have discovered radio there is only one Mecca this week. It is the Annual Radio World's Fair, which will unfold during six short days and nights the new 1930 pageant of radio genius and artistry.

It has been going on for six years, this annual parade of the industry's accomplishments for the twelvemonth. Yesterday ideas that were merely visions, imaginations, today realities. And somehow radio, the super-craftsman, the master showman, has performed and justified the expectancy of thousands of its devotees, who religiously pilgrimage toward the Elysian temple of its god.

Radio has a habit of doing things in a staggering, colossal way. Such is broadcasting, with its nation-wide, even international coverage; such is radio manufacture with its millions of receivers from the factories each year. And now the "biggest show on earth," the largest industrial show under one roof!

At 2 o'clock tomorrow afternoon the heavy doors of Madison Square Garden will swing open. This will be the "advance" opening, for the impatient fans may not wait till the "official" opening, which occurs at 7:30 that evening.

Radio show openings are famous. This one will be memorable. Congressman Wallace White from Maine, who fathered the present radio act, will be present as the guest of honor at the opening. Sir Thomas Lipton, noted English sportsman, and Count Felix von Luckner, German navy war raider, will give the ceremony an interesting international aspect.

During the broadcasting of this event, an annual radio ritual that takes place in the special studio built on the exposition floor, Miss Olive Shea, who has been chosen as the most beautiful radio artist in America, will, no doubt, be seen.

Beyond the portals of the broadcasting studio and into the paradise of displays, where several hundred manufacturers of sets and accessories of all sorts are bringing before the critical public eye the efforts of their technicians during the past year, thousands of hungry enthusiasts will run, look, appraise, comment and, foregoing.

Radio is a complicated mystery. It is full of disturbing ramifications. This

(Continued on page twenty)

World Good Will

Program Interchange Best Peace Promotion by Nation Says Commerce Head

was sent and re-broadcast, meant of assured chances and demonstrations. Understanding few hours scene of an interest

them. That at the same time they learn more about our nation, our people, our motives and ideals is greatly to be desired.

We may well expect that at some future date—one not so far in the future, at that—it will be possible to listen in on regularly scheduled features from distant parts of the earth. Latin-American growers will advertise their coffee or bananas around the world with characteristic programs from Brazil or Costa Rica. The spaghetti manufacturer will give us broadcasts from Milan and the jeweler will advertise his diamond stock by entraining us with a diamond miners' quartet from some South African field. Our warm summer evenings will be made more bearable as the refrigerator manufacturer brings to us a running description of a sub-zero blizzard scene in southern Argentina with pictures.

Radio the Peacemaker

These forecasts are not visionary. They are more than merely foreshadowed. The fact awaits on the final developments only, and, as in the past, we may assure ourselves that those devoted to the necessary research are fully capable of performing the necessary miracles. Their success is inevitable. More than one threatened international clash of the future will be "called on account of radio."

The surest foundation for the betterment of relations among nations is the groundwork of closer acquaintanceship among their respective peoples. Radio is one of the most potent and effective contributions in that good work.

Viennese Tunes Featured

On WEAH Hour, Monday

Vienna, which is often called "the world capital of music," is the source from which will be drawn the program of the General Motors Family Party Monday, and in which Lewis James, tenor, and Frank Black's Orchestra will be presented.

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N.Y. Herald-Tribune
Sept 22, 1929

devices, such as straightline vol- controls, and power resistances of types.

ne national tuners, including the -29 and the new short wave thrill are features that constructors will want to miss. Also featured will a remote control turning device and complete components for making any of receivers.

A complete new line of resistance power devices will also be shown Aerovox and the International Resistance Company, with many unique applications for voltage ballast and set control.

There will be displayed the new caption reproducer units for public address systems, as well as the new self-adjusting line voltage control of superlite.

The new Insuline electrostatic lightning arrester may be of interest to a number of suburban listeners visiting the show.

Also there is bound to be a lot of interest shown in the complete system for line interference and man-made static eliminators displayed at the Buchmann headquarters.

"Screen-Grid" Popular

All of the new receivers for home building and the kits and circuits seem to center on the use of the new screen-grid valves in the radio amplifiers, together with linear power detection or space-charge detection, coupled with either one or two stages of push-pull amplification at audio-frequency, with two -45 type valves in the output stage. Set builders are advised to shield their sets up to the teeth, with single-control features and trimmers much in evidence. It is interesting to note that this is something agreed upon by both the kit designers and the engineers who produce the designs for the ready-made receivers.

The S-M kits and parts are of even better construction and feature more radical improvements than past designs and should make mighty efficient receivers when put together efficiently.

Complete Parts for Amateurs

Although the mode for making one's own set is not so fashionable nowadays there is every chance for the experimenter to go one step farther this year in building even a better set than in the days when these receivers were the only kind obtainable, and when anybody who wanted a receiver either had to build it himself or have some one handy with tools and having a knowledge of construction, build it for him. There is plenty of new material to work with and the specialists in producing these ingenious parts and devices have been spared no expense to make them as good as humanly possible.

At any rate the experimenter will find in the show a veritable haven for the DX fan, and the tinkerer both in new apparatus and with accessories for making the old set work better.

Transmitting Apparatus

For the experienced amateur will be shown all types of transmitting apparatus, together with new tubes and meters for transmitting set adjustment that should enable him to build more efficient transmitters to help him in his ever expanding quest for reaching the corners of the earth with his eternal "CQ's" and straining ears.

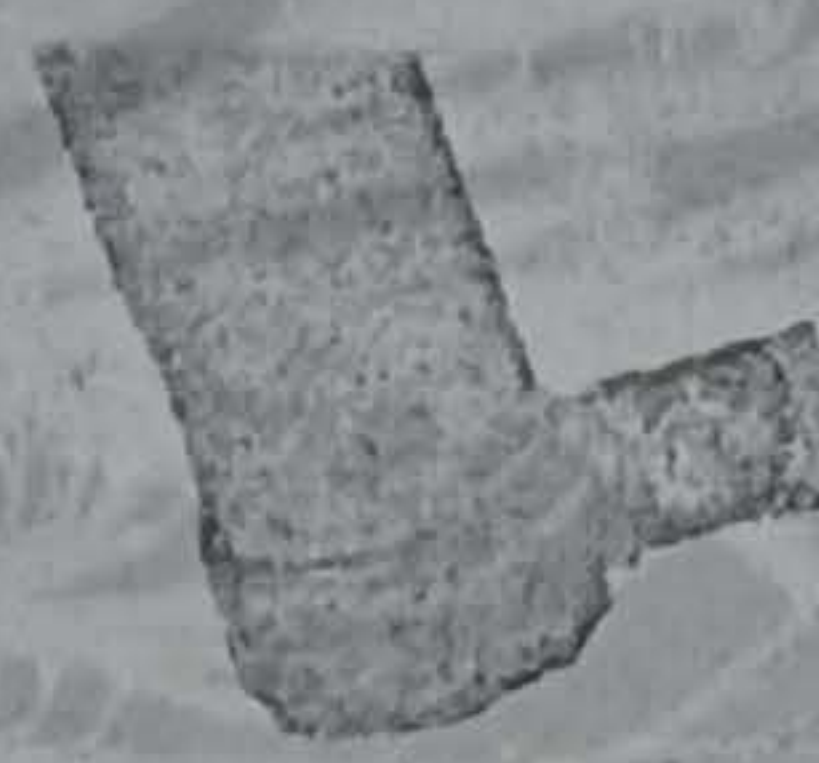


ELECTROSTATIC
Double duty lightning arrester
Shielded,
—new principle
reduces static

The Electrostatic is the new principle, totally shielded lightning arrester with special resistance and condenser and choke coil filter system, together with self-protection fuse. The net result is nothing short of revolutionary. Absolute protection for both house and set. Definite static reduction and general improvement in radio reception. Fully guaranteed and backed by a \$100 insurance bond.

Get the new Electrostatic at your dealer's or send direct.
INSULINE CORP. OF AMERICA
79-89 Cortlandt Street, New York, N. Y.

Right: Electrad fixed resistor for use in plate circuits, and (above) volume control unit made by same manufacturer



Nikola Tesla Tells of New Radio Theories

(Continued from page one)

his experiments from 1887 to 1889 his object was to demonstrate a theory postulating a medium filling all space, called the ether, which was structureless, of inconceivable tenacity and yet solid and possessed of a rigidity incomparably greater than that of the hardest steel. He obtained certain results and the whole world acclaimed them as an experimental verification of that cherished theory. But in reality what he observed tended to prove just its fallacy.

"I had maintained for many years before that such a medium as supposed could not exist, and that we must rather accept the view that all space is filled with a gaseous substance. On repeating the Hertz experiments with much improved and very powerful apparatus, I satisfied myself that what he had observed was nothing else but effects of longitudinal waves in a gaseous medium, that is to say, waves propagated by alternate compression and expansion. He had observed waves in the ether much of the nature of sound waves in air.

"Up to 1896, however, I did not succeed in obtaining a positive experimental proof of the existence of such a medium. But in that year I brought out a new form of vacuum tube capable of being charged to any desired potential, and operated it with effective pressures of about 4,000,000 volts. I produced cathodic and other rays of transcending intensity. The effects, according to my view, were due to minute particles of matter carrying enormous electrical charges, which, for want of a better name, I designated as matter not further decomposable. Subsequently those particles were called electrons.

"One of the first striking observations made with my tubes was that a purplish glow for several feet around the end of the tube was formed, and I readily ascertained that it was due to the escape of the charges of the particles as soon as they passed out into the air; for it was only in a nearly perfect vacuum that these charges could be confined to them. The coronal discharge proved that there must be a medium besides air in the space, composed of particles immeasurably smaller


than those of air, as otherwise such a discharge would not be possible. On further investigation I found that this gas was so light that a volume equal to that of the earth would weigh only about one-twentieth of a pound.

"The velocity of any sound wave depends on a certain ratio between elasticity and density, and for this ether or universal gas the ratio is 800,000,000,000 times greater than for air. This means that the velocity of the sound waves propagated through the ether is about 200,000 times greater than that of the sound waves in air, which travel at approximately 1,085 feet a second. Consequently the speed in ether is 900,000x1,085 feet, or 186,000 miles, and this is the speed of light.

"As the waves of this kind are all the more penetrative the shorter they are, I have for years urged the wireless experts to use such waves in order to get good results, but it took a long time before they settled upon this practice.

"Although the world is still skeptical as to the feasibility of my undertaking, I note that some advanced experts, at least, share my views, and I hope that before long wireless power transmission will be as common as transmission by wires."

According to Mr. Tesla, the present broadcasting station does not propagate Hertzian waves, as has always been supposed, but acts more like an "ether whistle"—transmitting waves through the ether similar to the waves transmitted by an ordinary whistle through air. He also expressed his disbelief in the Heavenside layer, and



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BIG DEMAND for RADIO OPERATORS and SERVICE MEN

RADIO is calling for men... trained men. Thousands of good jobs are now open. Positions that pay from \$2,000 and up a year. Prepare at once for the success you've longed for. Thrilling work, easy hours, vacations with pay and an opportunity to see the world.

Training takes but a few hours a day. This big resident school located in the heart of New York gives you all you need to know to insure your success in every phase of Radio, including servicing, broadcasting and airplane Radio equipment. You study under the personal instruction of RCA trained men. You have access to a vast store of apparatus. You learn to solve every Radio problem with your own hands and brain. That's why you quickly get the commercial confidence that commands big pay.

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This is the only course backed by RCA. Is it any wonder our students are in demand? The progress of Radio is measured by the great research laboratories of

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Why struggle along on a small salary? Why put off success when it can easily be yours in only a short time? Speed up your earning capacity. Get out of the low pay rut. See how you, too, can earn more money than you ever earned before in Radio... the big money business of today. Ask for Free Book showing glorious opportunities in Radio.



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claimed that the reflection of waves back toward the earth was due to the change of medium encountered at the vacuum boundary of the atmosphere. At Colorado Springs, about thirty years ago, this scientist had a Tesla coil seventy-five feet in diameter, which produced voltages above 12,000,000, and sparks over 100 feet long. Elec-

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THE America recognizing value. A simple Steinite offers a feature of high lower-priced set

Here is a great making the Stein season. "Why radio buyers, at

What has made set—at this a overwhelming made possible of a million set are devoted to plete—from unit—true or research depart of the field has ing to a new ago it produces America's first

We have listed in this advertisement check them ear any set you have offers you more with its three screen-grid circuitless, inspiring dynamic speaker glorious voice.

Steinite has price—which world. Once Steinite, we know too, will experience a thrill



SUPER

Editorial Comment

Radio Waves and the Transmission of Electrical Energy for Power

DR. E. F. W. ALEXANDERSON, consulting engineer of the General Electric Company and the Radio Corporation of America, in an address at the annual dinner of the Sigma Xi Society at the Hotel Astor in New York City, last April, predicted that the radio wave would soon be used for the control of vast amounts of power, and would supersede much of the cumbersome machinery now used in power production and transmission.

"The electric power industry cannot remain much longer untouched by the discoveries of radio," he said. "It is just waiting until this new knowledge has been widened and matured, so that it can be put into use on a wider scale, and this is the real significance of the entrance of the electrical industry into radio, and the latest branch of it, television."

Ten days after Dr. Alexander's startling prediction, electric lamps, held or suspended in the air without any connection to power wires, were made to glow brightly when high frequency waves were directed upon them in a demonstration of power transmission by radio by two Westinghouse engineers, Dr. Phillips Thomas and Dr. Harvey C. Rentschler, before the New York Electrical Society in New York City. Dr. Rentschler also displayed a novel radio furnace, in which metallic tungsten, among the most infusible of all metals, was heated white hot in an instant by the radio waves.

"We may visualize," said Dr. Thomas at this demonstration, "a parallel beam of radiation ten centimeters (four inches) across, along which is being sent ten kilowatts of energy. What sort of effects shall we find? Will this be the means for delivering energy for heat and light to individual houses? Dr. Nikola Tesla had a similar idea several years ago. Later improvements in the radio art make it interesting to consider such a possibility once more."

Guglielmo Marconi, inventor of the Marconi wireless system, while visiting this country last October, for the first time in several years, delivered an address on radio before a notable gathering of scientists at the Engineering Societies Building in New York City, in which he said:

"I hope I will not be thought too visionary if I say that it may be possible that some day electric waves may also be used for the transmission of power, should we succeed in perfecting devices for projecting the radiation in parallel beams in such a

manner as to minimize their dispersion and diffusion into space."

Dr. Nikola Tesla, one of the earliest pioneers in wireless, inventor of the alternating current system of power transmission, the induction motor, and many other notable electrical devices, the day before Marconi made the foregoing appeal "not to be thought too visionary," wrote a modest but direct statement of what he has already accomplished. Dr. Tesla said:

"The transmission of power without wires is not a theory or a mere possibility, as it appears to most people, but a fact demonstrated by me in experiments which have extended for years. The recent demonstrations of a number of experts with very short waves, have created the impression that power will be eventually transmitted by such means. In reality, experiments of this kind are the very denial of the possibility of economic transmission of energy. No concentration of energy such as I attain in my wireless power system can or will ever be achieved through the instrumentality of reflectors, for in transmitting energy in this manner the receiver can collect only an amount proportionate to the area exposed to the rays, while in my system it draws the energy from an immense reservoir in ever so much greater quantity. My plans for a power plant have been developed to the point of application, and I am using every effort to give to the world this, my best and most important work, as soon as possible. I have in view a number of places which seem well suited for the purpose, but my warmest wish is to transmit power from Niagara Falls, where the first triumph with my alternating system was achieved."

And meantime the entire world, with its vast resources of electrical energy in inland lakes, rivers and waterfalls, coal, wind, ocean waves and heat of the sun going to waste in billions of horsepower every day, waits patiently while radio scientists monkey with bulbs and reflectors to carry giant loads of chained lightning. It is about time some of them wake up to the fact that while they are shuffling around with little short-wave reflector sparks, Dr. Tesla has experimented with tremendous electrical power flashes, each more than one hundred and fifty feet in continuous length, under perfect wireless control. Dr. Tesla has said so himself, his veracity is unquestioned, and his record of great accomplishments thus far backs him up. The "big business" end of the electrical industry ought to dig Dr. Tesla out of his laboratories long enough to say to him "Show me!" for there is enough money in it to suit even the wildest dreamers of Wall Street if he is right.

chandise through ethereal advertising. I find this by 1234567890

A Logical Discussion on the Transmission of Power by Radio

Experimenters Have Been Devoting a Great Deal of Their Time Trying to Solve This Problem

By KENNETH M. SWEZEY

RADIO has sprung unusually fast from technical obscurity to a popular utility, through broadcasting, and to many it seems to have reached its limit of perfection and usefulness. Transmitting stations have arisen in numbers sufficient to intermesh their waves in a blanket which covers every acre of the country. Receiving sets are so thick that their antennae spider-web the horizon line. The broadcast programs are in portions of the cycle above the reproach of the most fastidious. What more could one want? What more is possible?

In answer to those questions the echoes of a dozen unsolved problems assert themselves. How can static be eliminated? Who will pay for future broadcasting? When can the owner of a set be freed from technical worry? How can receiving set upkeep be minimized? How can distortion be done away with? What are the limiting factors of super-power?

Important Question

The question of who will pay for broadcasting is an old one, and misleading. The people who use the sets, of course, always pay; no matter what distribution or collection system is used. It resolves itself to a question, rather, of how, by what specific means, will the expenses of broadcasting be paid. At present the sale of sets and parts, and of general merchandise through ethereal advertising,

As it stands, the system is backwards. For all the power that is used in the six hundred or so transmitting stations of the country, at least twenty times as much is used in the aggregate of receiving sets. Perhaps this before has been overlooked but it stands out defiantly. Assuming that the six hundred stations broadcast with an average of 1,000 watts, and that two million tube receiving sets consume an average of 6 watts each—which is low, by the way—then a total of 600,000 watts would be propagated and a total of 12,000,000 watts be used to make it audible at the receivers.

A Possible Solution

That fundamental weakness is responsible for the necessity of five and eight tube sets—those expensive white elephants which advanced fans must now have in order to meet certain particular requirements. If appreciable power could be conveyed to the receiving set a single tube, or even a crystal, could do the work of an eight-tube super-heterodyne; at the same time securing greater ease of control and less distortion. The works of a set then would need not cost more than \$10 or \$15, and what upkeep expense there was would be chiefly for the actual broadcasting service.

The cost of bare maintenance of a three-tube set—tubes and battery cost—may amount to about \$20 a year. Multiply this by two million and you have the

If but less than a single watt were available at the receiver no tubes would be needed, even for operating a loud-speaker. If energy could be transmitted efficiently a total of 2,000 kilowatts would suffice for all our present needs and could be sent from four super stations of 500 kilowatts each.

Then with the best of paid talent the annual cost of both the transmitting and receiving set upkeep could well stay below \$15,000,000.

But with our present system this is obviously impossible. The waves sent out are chiefly radiations, and because they are such the greatest part of their energy is irrecoverably lost.

Beam Transmitter

By concentrating the waves into a beam the recoverable energy is increased, but in the same degree the usefulness as a broadcast transmitter is decreased, for the area over which the waves may be intercepted is restricted.

It is this lack of power weakness that is also the main cause of static trouble. Atmospheric electricity will always be with us, and its nature is so closely allied to that of radio waves that it cannot be eliminated in any practical way so long as its intensity approaches and exceeds that of the impulses that are wanted. The only satisfactory solution to the problem seems to be in increasing the available

power. The ones that are greatest always win.

Distortion, too, is due chiefly to a lack of antenna energy in the receiving set, for it comes through the inaccurate repeating of regeneration, through small differences in tube characteristics and through interstage transformers. If there was the energy available at the antenna that is now available at the output of the last tube the amplifier could be eliminated, and with it the distortion that it produces.

One often reads in the press the announcement that some one at last has found means to send power by radio. If it were true the industry of the world would be revolutionized. As facts stand, this has not as yet been practically accomplished. Lamps can be lit by the radiations of the ordinary transmitter over very short distances, but the efficiency is so extremely small that commercial promotion of the phenomenon would be ridiculous.

Nikola Tesla was the first to try to solve the problem, and if success is ever achieved it will doubtless be by his system, into which he has put so much tireless labor. Professor Helmholtz, Lord Kelvin and a number of able contemporaries believe the plan entirely feasible if apparatus could be developed to generate and control the proper kind and intensity of electricity. Tesla has long since done this, and the system seems only

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By James S. Cault

INVENTOR

Radio

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It is this lack of power weakness that is also the main cause of static trouble. Atmospheric electricity will always be with us, and its nature is so closely allied to that of radio waves that it cannot be eliminated in any practical way so long as its intensity approaches and exceeds that of the impulses that are wanted. The only satisfactory solution to the problem seems to be in increasing the available

power. The ones that are greatest always win.

Distortion, too, is due chiefly to a lack of antenna energy in the receiving set, for it comes through the inaccurate repeating of regeneration, through small differences in tube characteristics and through interstage transformers. If there was the energy available at the antenna that is now available at the output of the last tube the amplifier could be eliminated, and with it the distortion that it produces.

One often reads in the press the announcement that some one at last has found means to send power by radio. If it were true the industry of the world would be revolutionized. As facts stand, this has not as yet been practically accomplished. Lamps can be lit by the radiations of the ordinary transmitter over very short distances, but the efficiency is so extremely small that commercial promotion of the phenomenon would be ridiculous.

Nikola Tesla was the first to try to solve the problem, and if success is ever achieved it will doubtless be by his system, into which he has put so much tireless labor. Professor Helmholtz, Lord Kelvin and a number of able contemporaries believe the plan entirely feasible if apparatus could be developed to generate and control the proper kind and intensity of electricity. Tesla has long since done this, and the system seems only

LIGHT, heat and power without it. Tesla breaks silence of many years, hearing the stage of complete perfection of his system for the possible to light homes, offices and power to run ships, airplanes and critical machinery. He is now making the question of his revolutionizing the world. Tesla was born in Serbia and earned degrees from Yale and Columbia and from the Polytechnic in Vienna. He took out many patents.

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Assoc., A. I. E. E.
By James S. Cault

INVENTOR

Radio

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NEXT WE

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The Evening World RADIO

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NEW YORK, SATURDAY, MARCH 15, 1924.

Radioed Light, Heat and Power Perfected by Tesla

INVENTOR ANNOUNCES FINAL SUCCESS OF EXPERIMENTS
BEGUN THIRTY YEARS AGO

By James S. Caulfield
Assoc., A. I. E. E.

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LIGHT, heat and power without the aid of wires is bearing the stage of completion, Prof. Nikola Tesla breaks silence of many years to announce the perfection of his system for transmitting power without wires. By means of this power it will be possible to light homes, offices and streets; furnish power to run ships, airplanes and all types of electrical machinery. He is now making preparation for the erection of his revolutionizing power plant.

Prof. Tesla was born in Serbia and received his education at the University of Prague, and received honorary degrees from Yale and Columbia Universities and from the Polytechnic in Vienna. He came to this country in 1884 and took out naturalization papers. He was the only woman inventor in that part of the country, where she had studied with her father, also an inventor. Nikola inherited his mother's talent for inventing and began his practical work in Budapest, Hungary, in 1881, where he made the first telephone repeater.



Special Features

- A New Reflex Circuit... Page 3
- A Night With Will Johnstone and the Radio Artists... Page 5
- An Efficient Australian Circuit... Page 16

After an interview with Prof. Tesla in his apartment on Park Avenue the writer can confidently state that the famous inventor is one of those few productions of nature that have been termed geniuses. His individuality is assertive and his mind is the embodiment of concentrated and continuous thinking. Thinking is his life work and his pleasure. He is always thinking, and in his flights of imagination there is nothing which is impossible, nothing which cannot at some time be realized.

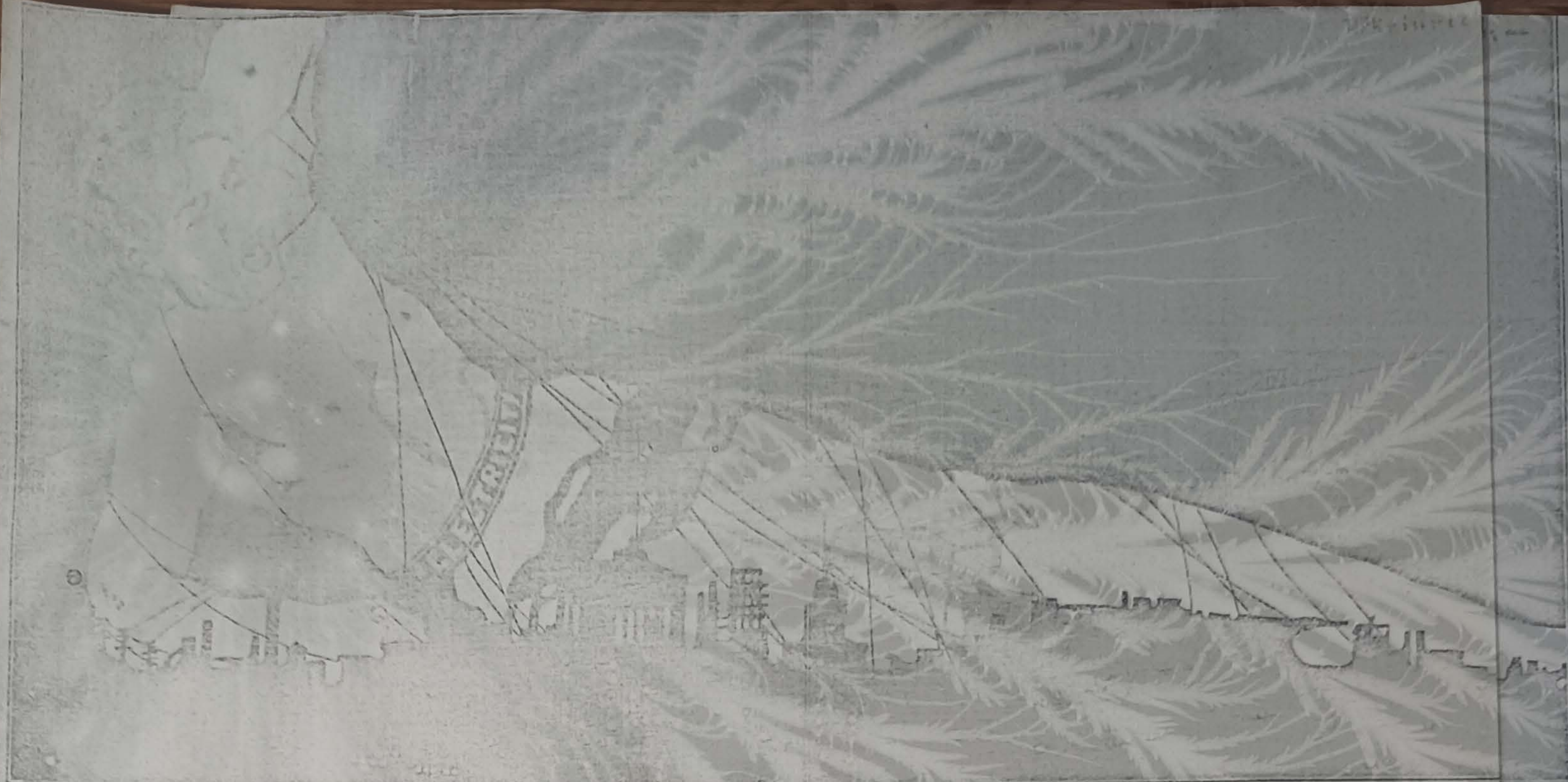
His passion for the new is intense. Naturally of an extremely emotional disposition, his nerves are constantly at a fearful tension. His will power is also enormous. Mr. Tesla's power of concentration makes him desire solitude, and his laboratory and workshop are sealed books to the outer world. His experiments are carried on at his own expense, and to the layman they would seem as they really are, the essence of originality.

At one time many of his friends denounced him as

a dreamer and others called his schemes ridiculous. On close inspection his ideas will be found to be twenty-five to one hundred years ahead of time. Here is an example: Back in 1888 The Evening World printed an exclusive interview with Tesla, at which time he stated that the power of Niagara Falls would be developed. The public thought light of it and in a short time it was forgotten. However, some score years later the Falls were developed and at the present time plans are being made to transmit power from Niagara to supply the New England States.

In the same year Tesla, through the medium of this paper, announced that he had developed a system of communication for ships at sea. This was three years earlier than the famous Marconi's experiments. Other inventions of the master electrician made it possible to transmit an alternating current of electricity. The development of motors for trolley cars and subways and electric drive on cranes all owe their being to

(Continued on Second Page.)



Electricity is a youthful giant. Not yet do we know its power.

WHAT WE WILL DO WITH ELECTRICITY

BY
NIKOLA TESLA

WITH DECORATIONS BY
R. F. HEINRICH



ANY a would-be discoverer, failing in his efforts, has felt the regret to have been born at a time when everything has been already accomplished and nothing is left to be done. This erroneous impression that, as we are advancing, the possibilities of invention are being exhausted, is not uncommon. In reality it is just the opposite. Spencer has conveyed the right idea when he likened civilization to the sphere of light which a lamp throws out in darkness. The brighter the lamp and the larger the sphere the greater is its dark boundary. It is paradoxical yet true to say, that the more we know the more ignorant we become in the absolute sense, for it is only through enlightenment that we become conscious of our limitations. Precisely one of the most gratifying results of intellectual evolution is the continuous opening up of new and greater prospects. We are progressing at an amazing pace but the truth is that even in the field most successfully exploited the ground has only been broken. What has been so far done by electricity is nothing compared with what the force has to store.

Only this, but there are now innumerable things in old-fashioned ways which are inferior in economy, convenience and many respects to the new method. So great are the advantages of the latter that whenever an opportunity presents itself the engineer advises his client to "do it electrically."

Consider, in illustration, one of the largest industries, that of coal. From this valuable mineral we chiefly draw the man's stored energy which is required to meet our industrial and commercial needs. According to statistical records the output in the United States during the past year was 420,000,000 tons. In perfect engines this fuel would have been sufficient to develop 500,000,000 horsepower steadily for one year, but the squandering is so reckless that we do not get more than five per cent. of its heating value, on the average. There is an appalling waste in mining, handling, transportation, storage and use of coal which could be very much reduced through the adoption of a comprehensive electrical plan in all these operations. The market value of the yearly product could be easily doubled and an immense sum added to the revenues of the country. What is more, inferior grades, billions of tons of which are being thrown away, might be turned to profitable use.

Similar considerations apply to natural gas

and mineral oil, the annual loss of which amounts to hundreds of millions of dollars. In the very near future such waste will be looked upon as criminal and the introduction of the new methods will be forced upon the owners of such properties. Here, then, is an immense field for the use of electricity in many ways, vast industries which are bound to be revolutionized through its extensive application.

To give another example, I may refer to the manufacture of iron and steel which is carried on, in this country, on a scale truly colossal. During the last year, notwithstanding unfavorable business conditions, 31,000,000 tons of steel have been produced. It would lead too far to dwell on the possibilities of electrical improvements in the manufacturing processes themselves and I will only indicate what is likely to be accomplished in using the waste gases from the coke ovens and blast furnaces to generate electricity for industrial purposes.

Since in the production of pigiron, for every ton about one ton of coke is employed, the yearly consumption of coke may be put at 31,000,000 tons. The combustion in the blast furnaces yields, per minute, 7,000,000 cubic feet of gas of a heating value of 110 B. T. units per cubic foot. Of this total, without making special provision, 4,000,000 cubic feet may be made available for power purposes. If all the heat energy of this gas could be transformed into mechanical effort it would develop 10,350,000 horsepower. This result is impossible but it is perfectly practicable to obtain 2,500,000 horsepower electrical energy at the terminals of the dynamos.

Utilization of Waste Gases.

IN the manufacture of coke approximately 9,400 cubic feet of gas are evolved per ton of coal. This gas is excellent for power purposes, having an average heating value of 600 B. T. units, but very little is now used in engines, largely because of their great cost and other imperfections. A ton of coke requires about 1.32 tons of American coal, hence the total coal consumption per annum on the above basis is nearly 41,900,000 tons which give, per minute, 733,000 cubic feet of gas. Assuming the yield of surplus or rich gas to be 333,000 cubic feet, the balance of 400,000 cubic feet could be used in gas engines. The heat contents would be, theoretically, sufficient to develop 5,660,000 horsepower of which 1,500,000 horsepower could be obtained in the form of electric energy.

I have devoted much thought to this industrial proposition and find that with new,

efficient, extremely cheap and simple thermodynamic transformers not less than 4,000,000 horsepower could be developed in electric generators by utilizing the heat of these gases, which, if not entirely wasted, are only in part and inefficiently employed.

With systematic improvements and refinements much better results could be secured and an annual revenue of \$50,000,000, or more, derived. The electrical energy could be advantageously used in the fixation of atmospheric nitrogen and production of fertilizers for which there is an unlimited demand and the manufacture of which is restricted here on account of the high cost of power. I expect confidently the practical realization of this project in the very near future and look to exceptionally rapid electrical development in this direction.

WATER-POWER offers great opportunities for novel electrical applications, particularly in the department of electro-chemistry. The harnessing of waterfalls is the most economical method known for drawing energy from the sun. This is due to the fact that both water and electricity are incompressible. The net efficiency of the hydro-electric process can be as high as eighty-five per cent. The initial outlay is generally great but the cost of maintenance is small and the conveniences offered ideal. My alternating system is invariably employed and so far about 7,000,000 horsepower have been developed. As generally used we do not get more than six hundredths of a horsepower per ton of coal per year, this water energy is therefore equivalent to that obtainable from an annual supply of 120,000,000 tons of coal, which is about twenty-five per cent. of the total output in the United States. The estimate is conservative and in view of the immense waste of coal, fifty per cent. may be a closer guess.

We get better appreciation of the tremendous value of this power in our economic development when we remember that unlike fuel, which demands a terrible sacrifice of human energy and is consumed, it is supplied without effort and destruction of material and equals the mechanical performance of 150,000,000 men—one and one-half times the entire population of this country. These figures are imposing, nevertheless, we have only begun the exploitation of this vast national resource.

There are two chief limitations at present: one in the availability of the energy, the other in its transmission to distance. The theoretical power of the falling water is enormous. If

Transmission of energy without wires has been the life aim of the inventor. This aim he now claims to have achieved at the age of sixty-seven. For years he has virtually secluded himself in New York, living a life of solitude so as to be able to devote all his time and energy to the perfection of his wireless system of power transmission. In discussing the system which is capable of operating aircraft, ships and all kinds of machines, he said: "Not only is this possible, but I am confidently expecting that by far the largest amount of energy will be transmitted in this manner. The system has been fully developed and demonstrated experimentally, but most of the experts are still puzzled. They claim that the power would be transmitted in all directions and consequently most of it would be lost, the same as in the operation of radio receivers. That is a fundamental mistake.

"It is true that my transmitter produces an effect all over the globe, but it is only force that is conveyed to every point and not energy. To make this understandable to the layman, suppose that the earth were a hollow reservoir into which water is forced by a pump. It does not require much scientific knowledge to perceive that the pressure will exist everywhere, yet no energy will be consumed. But the moment this reservoir is tapped and the water permitted to drive an engine, energy is derived from the pump. In my system energy is released by something like a combination lock, and only those who have the combination can draw from the source.

"In my original experimental demonstrations I have made great improvements and I can now definitely announce that the loss in the transmission to the greatest terrestrial distance—say 12,000 miles—will not amount to more than one-quarter of 1 per cent. This, of course, does not take into account certain unavoidable losses in the transmitter and receiver, which will amount to about 4 per cent. in the aggregate. In the present method of conveying energy through wires the loss amounts often to 20 per cent. or more and the distances are limited."

The writer asked Prof. Tesla if it was possible to



Tesla's Tower at Shoreham, L. I.

construct such a plant and actually operate it. He replied: "Most certainly, for I have developed all the details." He also stated that he expected to commence construction very shortly and will rely on his own resources. He was asked if the energy transmission was accomplished by the use of radio waves, which are sometimes called Hertzian waves. He answered:

"It is quite impossible to transmit any appreciable amount of energy by such means if it were not but for one reason—that waves such as Hertz thought to have discovered do not exist. It is true that some kind of energy is radiated from the wires, but it is not in the form of transverse waves in the ether. Moreover, this energy is irretrievably lost.

"I will illustrate by an example: Suppose that two wires are led from a generator of alternating currents and used to light an incandescent lamp at some distance. If the alternations of the current are very slow there will be virtually no energy radiated from the conductors. Imagine now that the current is made to pulsate faster and faster. Then in the same measure

was to use one wire instead of two. My first demonstration at Columbia University in 1891 excited considerable attention. Further work in this direction led me to consider the idea of maintaining the earth for the wire, and then my work in the transmission of energy without wires began. At that time it was believed that there was above the insulating air stratum surrounding the earth a highly rarefied atmosphere which was nearly conductive, and if such was the case then the planet was an electrical condenser of enormous capacity, through which energy could be transmitted. This, including everything, was the basis of my system, especially for such purposes as the radio.

"I made the marvelous discovery that the power responded to the currents imposed upon it exactly, as though it were completely insulated in space without any conducting envelope whatever. In other words, whatever be the electrical properties of the air at high altitudes, there was no heavy side-layer, a name given to the outer gaseous envelope of the earth, supposed to be rendered conductive through ionization caused by the sun's rays. This discovery showed that the most complex and rapid electrical oscillations—human speech and even power—could be transmitted through the earth far better than through any artificial cable or conductor. Experiments proved this to be the case." Tesla was asked if the wireless system would eventually supplant cables. "I would say, yes, eventually, but so long," he added smilingly, "as the art develops along the present lines, my friend Mackay needn't worry about his cables."

The illustrations show the ultimate Tesla Wireless Power Plant. In his early endeavors the inventor erected the tower shown in the photograph primarily to prove his theory. However, the war was upon us and the Government requested that it come down. After the war Prof. Tesla again started to prove his theory, but this time he chose Colorado Springs as the location of his laboratory. It was while at the "Springs" that he first demonstrated power transmitted without the aid of wires.

U. S. Radio Anglicizing Language of the World

BROADCASTING was born in America and it is natural that this country should lead the world in this art and its associated industries. Many of the 561 broadcasting stations, however, are not satisfied with transmitting radio programs throughout the North American Continent. Some of the fifty high-powered Class B stations, all of which are rated at 500 or more watts, and nine are of 1,000 watts power, are ambitious to entertain the whole world. This long-distance broadcasting is extending the use of the English language materially.

Some think it probable that within a few years English may come to be the universal language through the use of the radiophone. Commercial and amateur radio telegraph messages in English also

sular possessions, an extensive broadcasting net carrying Anglo-Saxon around the world is predicted. An international language will have to be developed if English or the so-called universal languages, Esperanto or Ido, will not suffice. Mr. Whittemore points out.

Trans-oceanic reception of United States broadcasts began last year, and now almost every night one or two American stations are heard in England and France. American stations have also been reported in Hawaii. Broadcasting from the States is heard regularly in Alaska, and every once in a while the acknowledgment of a program comes from distant points in South America. A broadcast from Chicago, intended for the Azores, was reported as received in Samoa. A whisper was heard in the South, and also in

abroad, international radio broadcasting is common in Europe to-day.

In Great Britain, where more American stations are heard than those of any other foreign country, local fans have an advantage over their cousins of this side of the Atlantic. Radio waves travel far better in the night than in the daytime, and for this reason we seldom hear British stations, unless they are transmitted after dark, from or about midnight in England. The British broadcast is heard here when we are in the midst of our evening programs. On the other hand, when it's 8 P. M. on our Atlantic Coast, it is 1 A. M. in London. If English stations want out this hour, when most American stations have signed off, they have a good chance to hear some of the big American trans-

...in a limited which covers every acre of the country. Receiving sets are so thick that their antennae spider web the horizon line. The broadcast programs are in portions of the cycle above the reproach of the most fastidious. What more could one want? What more is possible?

In answer to these questions the echoes of a dozen unsolved problems assert themselves. How can static be eliminated? Who will pay for future broadcasting? When can the owner of a set be freed from technical worry? How can receiving set upkeep be minimized? How can distortion be done away with? What are the limiting factors of super-power?

Important Question

The question of who will pay for broadcasting is an old one, and unending. The people who use the sets, of course, always pay; no matter what distribution or collection system is used. It resolves itself to a question, rather, of how, by what specific means, will the expense of broadcasting be paid. At present the sale of sets and parts, and of general merchandise through etherical advertising, pays; but whether this is an ultimate solution is dubious.

As long as the number of broadcasting stations reads in three figures, and the number of radio manufacturers reads in four, there can hardly be a totally satisfactory distribution of toll. Taxing tubes or batteries would not be fair, for who can say that the owner of a single tube set does not have all the service and advantages—in his way—that a broadcasting station could give to the owner of an 8-tube set? Government licensing would be no better, for there would be no way of honestly apportioning the collected money.

If there were but two or three manufacturers—and that is perfectly feasible if apparatus could be sufficiently developed so that it could be standardized—and four or five broadcasting stations for the entire country, the question of payment for broadcasting could be more satisfactorily met. Apparatus could be rented, like Bell telephones, or sold outright, like standard typewriters, and the user could at all times be sure of reliable maintenance service. The several broadcasters could afford to furnish the best of programs, for they would have a definite source of revenue.

the six hundred stations broadcast with an average of 1,000 watts, and that ten million tube receiving sets consume an average of 5 watts each—which is low, by the way—then a total of 600,000 watts would be propagated and a total of 12,000,000 watts be used to make it available at the receivers.

A Possible Solution

That fundamental weakness is remediable for the necessity of five and six tube sets—those expensive white elephants which advanced fans must have in order to meet certain technical requirements. If appreciable power could be conveyed to the receiving set a single tube, or even a crystal, would do the work of an eight-tube ether homologous; at the same time receiving greater ease of control and less distortion. The wastes of a set then would need not cost more than \$10 or \$15, and what upkeep expense there was would be chiefly for the actual broadcasting service.

The cost of bare maintenance of a three-tube set—tubes and battery cost—may amount to about \$30 a year. Multiply this by two million and we have the figure of \$60,000,000—just for keeping the tubes of the receiving sets lit. It has been said that a broadcasting station cannot keep going on less than \$10,000 a year. Some run as high as \$100,000. For the entire country the broadcasting upkeep costs must run above \$10,000,000 a year.

...and from first super stations of 500 kilowatts each.

There with the best of paid talent the annual cost of both the transmitting and receiving set wastes could well stay below \$25,000,000.

But without present apparatus this is obviously impossible. The waste sets are the bane of the hobbyist, and because they are not the greatest part of their cost is irreparable loss.

Power Transmitter

By concentrating the waves into a beam the available energy is increased, but at the same degree the usefulness as a broadcast transmitter is decreased, for the area over which the waves may be intercepted is restricted.

It is this lack of power weakness that is also the main cause of static trouble. Atmospheric electricity will always be with us, and its nature is so closely allied to that of radio waves that it cannot be eliminated in any practical way so long as its intensity approaches and exceeds that of the impulses that are wanted. The only satisfactory solution to the problem seems to be in increasing the available power at the receiver.

The transmitter may be likened to a train announcer, who must send his voice across a noisy railroad terminal. The distinctness with which he can be heard in any part of the building depends solely upon the relative intensity of the voice waves and the noise waves at that par-

...generation, through small differences in tube characteristics and through inductive transformer. If there was the energy available at the antenna that is now available at the output of the last tube the amplifier could be eliminated, and with it the distortion that it produces.

The other study is the power the announcement that some one at last has found means of sending power by radio. It is hard to see the industry of the world without being revolutionized. As facts stand, the only way to get power practically accomplished is to be lit by the radiation of the ordinary transmitter over very short distances, but the efficiency is so extremely small that commercial production of the phenomenon would be ridiculous.

Nikola Tesla was the first to try to solve the problem, and if anyone is ever achieved it will doubtless be by his system, into which he has put so much thought and labor. Professor Heinrich Lord Kelvin and a number of able contemporaries believe the plan entirely feasible if apparatus could be developed to generate and control the proper kind and intensity of electricity. Tesla has long since done this, and the system waits only to await its application.

The system makes use not of radiation but of true conduction, substituting the earth itself for the wire. That the earth is a conductor is demonstrated by the fact of its utilization as a telegraph return wire and as the ordinary radio ground connection. Tesla claims it to be a perfect conductor.

The average layman, and electrician as well, is so accustomed to using two wires to connect all his apparatus that he is likely to ask where the return wire is in Tesla's system. There is none, and for the reason that there need be none. By using alternating currents of proper frequency and correctly proportioning the circuits lamps may be lit and motors run by means of a single wire with no return.

This is easily demonstrable with the common Tesla resonant transformer or Tesla coil. A bank of lamps may be lit or wires melted by attaching one terminal to the coil and the other to an insulated capacitor, such as a metal plate or sphere. The capacitor serves as a sort of reservoir, which is filled and drained with the alternations of current.

In his radio transmitter Tesla mounts

The Radio Beginner's Series

Continued from page five

currents and drain a large B battery in no time. Even as it is, the UX-210 tube with 425 volts on the plate requires as normal operating voltage a grid battery of 45 volts to hold the plate current down to 12 milliamperes. This plate current is three or four times what the UV-201A takes at quarter the voltage without any C battery. The UX-210, even at 90 volts, has a normal operating grid voltage of 4.5 volts. The UX-120, a three-volt tube, with only 105 volts on the plate, requires a normal operating grid voltage of 12½ to keep the plate current at 100 volts on the plate is 100 milliamperes six volts on the grid. 200 volts on

other tubes. The degree of brightness of the filament will regulate the resistance from plate to filament and also, if desired, the resistance be increased or decreased by use of a C battery or a potentiometer, as shown dotted, or the grid need not be connected at all. The coupling condenser should be large as in resistance coupling upward from 5 mfd to 2 mfd being preferable, although as low as .01 mfd will work well.

This is a novel use of the tube. The filament is connected to the plate of the tube and applied to the plate of the

be no better, for there would be no way of honestly apportioning the collected money.

If there were but two or three manufacturers—and that is perfectly feasible if apparatus could be sufficiently developed so that it could be standardized—and four or five broadcasting stations for the entire country, the question of payment for broadcasting could be more satisfactorily met. Apparatus could be rented, like Bell telephones, or sold outright, like standard typewriters, and the user could at all times be sure of reliable maintenance service. The several broadcasters could afford to furnish the best of programs, for they would have a definite and continuous source of revenue.

Distance Wave May Travel

Undoubtedly, with transmitting and receiving apparatus which we have immediately at hand, this could be accomplished with passable success. But the equipment would be expensive and tremendously limited. Super-power would have to be used at the transmitter, and the sensitivity of the receiving sets increased with the increase in distance. As the distance which a Hertz wave transmitter may cover varies approximately with the square of the power used, it is obvious that the wattage would have to exceed that now in use manyfold. Unless the wave lengths that were used were widely separated, receiving sets within the vicinity of these powerful transmitters would be interfered with beyond remedy.

In true radio transmission it would seem to the writer that a goodly portion of the transmitted energy should be recoverable. In our present system it is almost a total loss. One could realize this more fully if all receiving sets had only crystals. From the most powerful of modern transmitters scarcely ever can a crystal set receive satisfactorily over more than a hundred miles. If it had not been for the invention of the vacuum tube detector, oscillator and amplifier the entire system would have been long ago pronounced a failure, or at least relegated to a limited commercial and ship-to-ship code service.

Continued from page five

currents and drain a large B battery in no time. Even as it is, the UX-210 tube with 425 volts on the plate requires as normal operating voltage a grid battery of 35 volts to hold the plate current down to 22 milliamperes. This plate current is three or four times what the UV-301A takes on quarter the voltage without any C battery. The UX-210, even at 90 volts, has a normal operating grid voltage of 4.5 volts. The UX-120, a three-volt tube, with only 135 volts on the plate, requires a normal operating grid voltage of 22½ to keep the plate current down to 6.5 milliamperes. The UX-112 at 90 volts on the plate requires six volts on the grid. All three of the new tubes are C battery tubes, while on the present tubes in use the C battery is a refinement and economy measure much advocated, but not used by any great percentage of set owners.

Reducing B Battery Current

Another way of securing amplification with a minimum of B battery drainage is the so-called "tone filter amplifier" in (1) of the figure. Here the coupling between the tubes is in the millions of ohms, variable leaks being used both for tube coupling and for grid leaks. Very low plate potential is used on the detector and, because of the tremendous resistance of the coupling, there is substantially no B bias on either of the next two tubes, but 90 volts on the last tube. The stopping condensers are .0005 mfd.

In place of either leaks, resistances, choke coils or transformers, the writer has frequently used and suggested coupling two tubes with a third tube, using the plate to filament resistance of the third tube as a coupling resistance, the diagram being shown at (2). Here we have a detector with one step of straight transformer-coupled audio. The first audio tube is coupled with the second audio tube through a tube placed between them as a resister. This tube requires a separate A battery, as shown. It cannot be used with the same A battery as the

other tubes. The degree of brightness of the filament will regulate the resistance from plate to filament and also, if desired, the resistance be increased or decreased by use of a C battery or a potentiometer, as shown dotted, or the grid need not be connected at all. The stopping condenser should be large as in resistance coupling, upward from .5 mfd. to 2 mfd. being preferable, although as low as .01 will work well.

This is a novel use for the tube. The 90 volts shown not only biases the plate of the resistance tube, but it passes through the tube and applies on the plate of the first audio tube. Of course, instead of 90 volts you can use up to 150 volts with benefit. Moreover, it is not essential to have a stage of transformer coupling precede this, and next week we will finally come around to the constant current amplifier, which is based on this simple tube resistance coupling with provisions for impressing a signal voltage on the resistance tube. At that time also we will reprint the diagram for a push-pull amplifier to complete the record.

Many times in the past we have printed the diagram for choke coil amplification. This is identical with the last two diagrams of last week's page, except that choke coils are used in place of resistance couplings. Many devices have been impressed into use as choke coils for this purpose. The secondary of an audio transformer, the primary of a bell ringing transformer, the Ford spark coil, various magnet windings, have all been used. Probably better than any of these is an audio transformer with primary and secondary connected in series aiding, making one coil of the two. You will have to reverse the connection between primary and secondary to be sure they are in the right order, but it makes no difference which end is connected to B battery and which to plate. A blocking condenser and a leak must be used as in resistance coupling.

likely to add where the return wire is in Tesla's system. There is none, and for the reason that there need be none. By using alternating currents of proper frequency and correctly proportioning the circuits lamps may be lit and motors run by means of a single wire with no return.

This is easily demonstrable with the common Tesla resonant transformer or Tesla coil. A bank of lamps may be lit or wires melted by attaching one terminal to the coil and the other to an insulated capacity, such as a metal plate or sphere. The capacity serves as a sort of reservoir, which is filled and drained with the alternations of current.

Pumping System

In his radio transmitter Tesla mounts a huge capacity, having ideal enveloping surfaces that prevent radiation, on top of a tower and starts up an electrical pumping system, pumping electricity into and out of the earth. The pressure distributes itself over the entire globe although it were a sphere of but moderate dimensions, and by using receiving apparatus at different parts of the world connected at one end to the earth and the other to a similar but smaller capacity the energy can be recovered with small loss. Distance need not be reckoned with any more than it need be reckoned in a wire circuit with negligible resistance.

If Tesla's system works as well practically as it does theoretically its adaptation to broadcasting will go far toward relieving all those problems which were first suggested. It would permit of super-power transmission, with all of the good qualities and none of those that now put a limit to its effectiveness.

Notwithstanding the development of hundreds of new circuits, there has not been a single basic and radical improvement on our present radio system since De Forest invented the three-element vacuum tube. Props have been designed and both transmitting and receiving sets have been pushed to the limits of their capacity, but as for something really new it has yet to appear. The condition is a definite indication that the point of the flattening of the curve has been reached.

assume for the rainclouds an average height of 15,000 feet, and an annual precipitation of thirty-three inches, the twenty-four hour power per square mile is over 4,000, and for the whole area of the United States more than 12,000,000,000 horsepower. As a matter of fact the larger portion of the potential energy is used in air-friction. This, while disappointing to the economist, is a fortunate circumstance for otherwise the drops would reach the ground with a speed of 800 feet per second, sufficient to raise blisters on our bodies, while hail would be positively deadly. Most of the water which is available for power purposes comes from a height of about 2,000 feet and represents over one and one-half billion horsepower, but we are only able to use an average of, say, one hundred feet which means, that if all the water power in this country were harnessed under the existing conditions only 80,000 horsepower could be obtained.

1000 Control Precipitation of Moisture.

BUT the time is very near when we shall have the precipitation of the moisture of the atmosphere under complete control and then it will be possible to draw unlimited quantities of water from the oceans, develop any desired amount of energy and completely transform the globe by irrigation and intensive farming. A greater achievement of Man through the medium of electricity can hardly be imagined.

The present limitations in the transmission of power to distance will be overcome in two ways; through the adoption of underground conductors insulated by power and through the introduction of the wireless art. The first plan I have advanced years ago. The underlying principle is to convey through a tubular conductor hydrogen at a very low temperature, freeze the surrounding material and thus secure a perfect insulation by indirect use of electric energy. In this manner the power derived from falls can be transmitted to distances of hundreds of miles with the highest economy and at a small cost. This initiation is sure to greatly extend the fields of electrical application. As to the wireless method we have only limited by the dimensions of this planet. In view of assertions of some misinformed experts to the effect that in the wireless system I have perfected the power of the transmitter is dissipated in all directions, I wish to be emphatic in my statement that such is not the case. The energy goes only to the place where it is needed and to no other.

When these advanced ideas are practically realized we shall get the full benefit of water-power and it will become our chief dependence in the supply of electricity for domestic, public and other uses in the arts of peace and war.

In the great departments of electric light and power immense opportunities are offered through the introduction of all kinds of novel devices which can be attached to the circuits at convenient hours for the purpose of equalizing the loads and increasing the revenues from the plants. I have myself knowledge of a number of new appliances of this kind. The most important among them is probably an electrical ice machine which obviates entirely the use of dangerous and otherwise objectionable chemicals. The new machine will also require absolutely no attention and will be extremely economical in operation, so that the refrigeration will be effected very cheaply and conveniently in every household. An interesting fountain, electrically operated, has been brought out which is likely to be extensively introduced and will afford an unusual and pleasing sight in squares, parks, hotels and residences. Cooking devices for all domestic purposes are being provided and there is great demand for practical designs and suggestions in this field. The same may be stated of electric signs and other attractive means of advertising which can be electrically operated. Some of the effects which it is possible to produce by electric currents are wonderful and lend themselves to exhibitions, and there is no doubt that much can be done in that direction. Theaters, public halls, and private dwellings are in need of a great many devices and instruments for convenience and offer ample opportunities to an ingenious and practical inventor.

A VAST and absolutely untouched field is the use of electricity for the propulsion of ships. The leading electrical company in this country has just equipped a large vessel with high speed turbines and electric motors and has achieved a signal success. Applications of this kind will multiply at a rapid rate for the advantages of the electrical drive are now patent to everybody. In this connection gyroscopic apparatus will probably play an important part as its general adoption on vessels is sure to come. Very little has yet been done in the introduction of the electrical drive in the various branches of industry and manufacture and the prospects are unlimited. Books have already been written on the agri-

cultural uses of electricity, but the fact is that hardly anything has been practically done. The beneficial effects of electricity of high tension have been unmistakably established and a revolution will be brought about through the extensive adoption of agricultural electrical apparatus. The safeguarding of forests against fires, the destruction of microbes, insects and rodents will, in due course, be accomplished by electrical means.

In the near future we shall see a great many new uses of electricity aiming at safety, particularly of vessels at sea. We shall have electrical instruments for preventing collisions and we shall even be able to disperse fogs by electric force and powerful and penetrative rays. I am hopeful that within the next few years wireless plants will be installed for the purpose of illuminating the oceans. The object is perfectly feasible and if carried out will contribute more than any other provision to the safety of property and human lives at sea. The same plant could also produce stationary electrical waves and enable vessels to get at any time accurate bearings and other valuable practical data without reference to the present means. It could also be used for time signalling and many other purposes of similar nature.

ELECTRO-THERAPY is another great field in which there are unlimited possibilities for electrical applications. High frequency currents especially have a great future. The time will come when this form of electrical energy will be available in every private dwelling. I consider it quite possible that through their surface actions we may do away with the customary bath, as the cleaning of the body can be instantaneously effected simply by connecting it to a source of currents or electric energy of very high potential, which results in the throwing off of dust or any small particles adhering to the skin. Such a dry bath, besides being convenient and time-saving, would also be of beneficial therapeutic influence. New electric devices for use of the deaf and blind are coming and will be a blessing to the afflicted.

In the prevention of crime electrical instruments will soon become an important factor. In the city, and country, as well as in the home, to town to rest and go well.

THE present international conflict is a powerful stimulus to invention of devices and implements of warfare. An electric gun will soon be brought out, the wonder is that it was not produced long ago. Dirigibles and aeroplanes will be equipped with small electric generators of high tension from which the deadly currents will be conveyed through tin wires to the ground. Battleships and submarines will be provided with electric and magnetic feelers so delicate that the approach of any body under water or in darkness will be detected. Torpedoes and floating mines are almost in sight which will direct themselves automatically and without fail get in fatal contact with the object to be destroyed. The art of Telautomatics or wireless control of automatic machines at a distance will play a very important part in future wars and, possibly, in the next phases of the present one. Such contrivances which act as if endowed with intelligence will be used in innumerable ways for attack as well as defense. They may take the shape of aeroplanes, balloons, automobiles, surface or under water boats or any other form according to the requirement in each special case and will be of greater range and destructiveness than the implements now employed. I believe that the telautomatic aerial torpedo will make the large siege gun, on which so much dependence is placed at present, obsolete. A volume might be filled with such suggestions without exhausting the possibilities. The advance even under the conditions existing is rapid enough, but when the wireless transmission of energy for general use becomes a practical fact, the human progress will assume the character of a hurricane. So all-surpassing is the importance of this marvellous art to the future existence and welfare of the human race that every enlightened person should have a clear idea of the chief factors bearing on its development.

WE have at our disposal three main sources of life-sustaining energy: fuel, water power and the heat of the sun's rays. Engineers often speak of harnessing the tides, but the dis-

positive, in a time not distant it is to flash any image formed in thought and render it visible at any place. The perfection of this means of reading create a revolution for the better in relations. Unfortunately, it is true, law breakers will avail themselves of the advantages to further their nefarious

Telegraphic Photography

GREAT improvements are still being made in telegraphy and telephoning. The receiving device which will be short and the sensitiveness of which can be almost without limit, will enable through aerial lines or cables having reduced the necessary working of infinitesimal value. This invention, however, with the necessity of making constructions which, however, are not perfect, it will also extend the wireless transmission of in all its department.

The next step is to be made in picture transmission. Ordinary methods and apparatus for telegraphing or telephoning picture practical difficulties have hampered realization. A number of improvements have been made and there is reason to expect that success will soon be achieved.

Another valuable novelty will be a writer electrically operated by the operator. This advance will fill a long felt want do away with the operator and save of labor and time in office. A very simple electric tachometer is prepared for the market and it is expected it will prove useful in power plants, stations, on boats, locomotives, and

Many municipal improvements of use of electricity are about to be made. We shall soon have everywhere smokers, dust absorbers, ozonizers, sterilizers, air, food and clothing, and accident on streets, elevated roads and in the will become next to impossible to con-

concerning truth is that the tide-water over one acre of ground will, on the average, develop only one horsepower. Thousands of mechanics and inventors have spent their best efforts in trying to perfect wave motors, not realizing that the power so obtained could never compete with that derived from other sources. The force of wind offers much better chances and is valuable in special instances but is by far inadequate. Moreover the tides, waves and wind furnish only periodic and often uncertain power and necessitate the employment of large and expensive storage plants. Of course there are other possibilities, but they are remote and

we must depend on the first of three resources. If we use fuel to get our power we are living on our capital and exhausting it rapidly. This method is barbarous and wantonly wasteful and will have to be stopped in the interest of coming generations. The heat of the sun's rays represents an immense amount of energy vastly in excess of waterpower. The earth receives an equivalent of eighty-three-foot pounds per second for each square foot on which the rays fall perpendicularly. From simple geometrical rules applying to a spherical body it follows, that the mean rate per square foot of the earth's surface is one quarter of that, or twenty and three-quarter-foot pounds. This is to say over one million horsepower per square mile, or 250 times the water-power for the same area. But that is only true in theory, the practical facts put this in a different aspect. For instance, considering the United States, and taking into account the mean latitude, the daily variation, the diurnal changes, the seasonal variation and casual clouds this power of the sun's rays reduces to about one-tenth, or one hundred thousand horsepower per square mile, of which we might be able to recover in high speed low pressure turbines ten thousand horsepower. To do this would mean the installment of apparatus and storage plants so large and expensive that such a project is beyond the pale of the practical. The inevitable conclusion is that water-power is by far our most valuable resource. On this humanity must build its hopes for the future. With its full development and a perfect system of wireless transmission of the energy to any distance man will be able to solve all the problems of material existence. Distance, which is the chief impediment to human progress, will be completely annihilated in thought, word and action. Humanity will be united, wars will be made impossible and peace will reign supreme.

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mean the installment of apparatus
and storage plants so large and ex-
pensive that such a project is beyond
the pale of the practical. The in-
evitable conclusion is that water-
power is by far our most valuable
resource. On this humanity must
build its hopes for the future. With
its full development and a perfect
system of wireless transmission of
the energy to any distance man will
be able to solve all the problems of
material existence. Distance, which
is the chief impediment to human
progress, will be completely annihila-
ted in thought, word and action.

Humanity will be united, wars will
be made impossible and peace will
reign supreme.

coming from the tide water
over one acre of ground will, on the
average, develop only one horsepower.
Thousands of mechanics and inventors
have spent their best efforts in
trying to perfect water motors, not
realizing that the power so obtained
could never compete with that de-
rived from other sources. The force
of wind offers much better chances
and is valuable in special instances
but is by far inadequate. Moreover
the tides, waves and winds furnish
only periodic and often uncertain
power and necessitate the employ-
ment of large and expensive storage
plants. Of course, there are other
possibilities, but they are remote and

we must depend on the use of three
resources. If we use fuel to get our
power we are living on our capital
and exhausting it rapidly. This
method is barbarous and wasteful
and will have to be stopped in
the interest of coming generations.
The heat of the sun's rays represents
an immense amount of energy vastly
in excess of waterpower. The earth
receives an equivalent of eighty-three-
foot pounds per second for each
square foot on which the rays fall
perpendicularly. From simple geo-
metrical rules applying to a spherical
body it follows that the mean rate
per square foot of the earth's surface
is one quarter of that, or twenty and
three-quarter-foot pounds. This is to
say over one million horsepower per
square mile, or 250 times the water-
power for the same area. But that
is only true in theory, the practical
facts put this in a different aspect.

For instance, considering the United
States, and taking into account the
mean latitude, the daily variation,
the diurnal changes, the seasonal
variations and casual changes this
power of the sun's rays reduces to
about one-tenth, or one hundred thou-
sand horsepower per square mile, of
which we might be able to recover in
high speed low pressure turbines ten
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of the parish priest, or orconomus, who is cart the statue off, with the aid of a piece of wood, of taking the statue which caused the French to off the peasants, and then it was both arms had been broken off the statue with the rocks. The statue was placed in the dispatch boat Entafetta, to the parts of the broken arms, which were preserved and crated, and they in due course with the statue at that time were now they have been by somewhere or other in the vaults of the Louvre, never having been upon the case. These vaults and garrets thousands upon thousands of cases and at great and small. They are being examined, but the progress of the work and the quantity of boxes and crates that a generation may elapse at the present progress before the missing arms of the de Milo are recovered.

PORT'S CLOSEST FRIEND A DUKE.
 curious that although Henri Rochefort's should have been despoiled of the Château de Port and of so much of its wealth by the and-Périgord family his most intimate and associate should be the Marquis de and-Périgord, Duc de Dino, who enjoys the distinction of having married two women in turn and of having been divorced from each of them. One of these women still to use the title of Marquise de Talleyrand, her husband being a marquis belonging to his father's dukedom. His assumed, in accordance with the present day, her maiden name, as Mrs. Adele Sampson, the Duc de Dino and of the Marquis de Rochefort are similar in many respects. Both quite the reverse of domestic, they of them in spite of their lineage and patriarchal mannerisms and prejudices radical to the extent of socialism, and possess a most extraordinary knowledge of everything relating to art and history. Many of the art treasures of the have found their way to this country at one or another, and may be seen in private collections and public institutions, notably in the Metropolitan Museum of Art in New York. Like Port, the duke helped Louis Michel, made the great strike took place at Amiens upon the scene with peculiar assistance in the strike. The duke possesses a large collection of books, including a volume of verses in "L'Art de Vous" and dedicated to his wife, Adele Sampson, and distinguished at the battle of Champagne in the war of 1914, greatly that his name was put forward for the cross of the Legion of Honor. This he refused on the ground that he had the misfortune to be a brother, Count Archibald de Talleyrand, serving against France as captain of the 1st German army. Despite his social life the Duc de Dino, who prefers to be called "de Rochefort," has his hours always filled with the study of his rank. In the Henry II dining room the ceremonial bearings are embroidered on the curtains, carved on the sideboards, painted on the walls, and on the porcelain made for the Duc de Rochefort, as well as engraved on the walls.

THE MARQUISE DE ROCHEFORT.
 for Rochefort, he, like his friend, the Duc de Port, has had some rather odd matrimonial experiences. He has been twice married. His first wife was Adele, the mother of his two children. He was under sentence of death in prison the suppression of the Commune, and, hearing that she was dying, in spite of all his professions of entertaining no religious belief, asked for and obtained permission to be brought by his faithful servant, in order that he might be ecologically married to her in the hospital, where he expired shortly afterward. His sentence was quitted to avoid servitude in New Caledonia, but he escaped by way of America. He established himself at Geneva in Switzerland. There he married a young girl more than thirty years his junior, the daughter of the widowed Marquis de Nauray, Olivier Fabi, who had been banished from New Caledonia, and was put to death by the Mahdi in the Sudan. This mar-

LETTERS TO THE EDITOR

TESLA ON WIRELESS.

Electrical Inventor Thinks Marconi's Plants Inefficient.

To the Editor of The Tribune:

Sir: In so far as wireless art is concerned there is a vast difference between the great inventor Thomas A. Edison and myself, integrally in my favor. Mr. Edison knows little of the theory and practice of electrical vibrations; I have, in this special field, probably more experience than any of my contemporaries. That you are not as yet able to impart your wisdom by wireless telephone to some subscriber in any other part of the world, however remote, and that the presses of your valuable paper are not operated by wireless power is largely due to your own effort and those of some of your distinguished confederates of this city, and to the efficient assistance you have received from my celebrated colleagues, Thomas A. Edison and Michael I. Pupin, assistant consulting wireless engineers. But it was all welcome to me. Difficulty develops resource.

The transmission across the Atlantic was not made by any device of Mr. Marconi's, but by my system of wireless transmission of energy, and I have already given notice by cable to my friend Sir James DeWar and the royal institution of this fact. I shall also request some eminent man of science to take careful note of the whole apparatus, its mode of operation, dimensions, linear and electrical, all constants and qualitative performance, so as to make possible its exact reproduction and a repetition of the experiments. This request is entirely impersonal. I am a citizen of the United States, and I know that the time will come when my busy fellow citizens, too absorbed in commercial pursuits to think of posterity, will honor my memory. A measurement of the time interval taken in the passage of the signal necessary to the full and positive demonstration will show that the current crosses the ocean with a mean speed of 625,000 miles a second.

The Marconi plants are inefficient, and do not lend themselves to the practice of two discoveries of mine, the "art of individualization," that makes the message non-interfering and non-interferable, and the "stationary waves," which annihilate distance absolutely and make the whole earth equivalent to a conductor devoid of resistance. Were it not for this deficiency, the number of words a minute could be increased at will by "individualizing."

You have already commented upon this advance in terms which have caused me no small astonishment, in view of your normal attitude. The underlying principle is to combine a number of vibrations, preferably slightly displaced, to reduce further the danger of interference, active and passive, and to make the operation of the receiver dependent on the co-operative effect of a number of attuned elements. Just to illustrate what can be done, suppose that only four vibrations were isolated on each transmitter. Let these on one side be respectively a, b, c and d. Then the following individualized lines would be ab, ac, ad, bc, bd, cd, abc, abd, acd, bed and abcd. The same article on the other side will give eleven similar combinations, and both together twenty-two lines, which can be simultaneously operated. To transmit one thousand words a minute, only forty-six words on each combination are necessary. If the plants were suitable, not ten years, as Edison thinks, but ten hours would be necessary to put this improvement into practice. To do this, Marconi will have to reconstruct the plants, and it will then be observed that the indefatigable Italian has departed from universal engineering customs for the fourth time. New York, Oct. 24, 1907. NIKOLA TESLA.

A TIME FOR SANITY.

Restoration of Confidence the Imperative Need.

To the Editor of The Tribune:

Sir: Your columns are always open to whatever seems to concern the public good. Will you let me say a few words, if you please? In lower New York this is the time for some people to show their

officer, says each rain-

The Department of Agriculture has arranged to meet all food for the autumn before it is taken from the United States. The commission is the separate accommodations for blacks and and has made numerous improvements to the food. It has been found that the food in the

FOR FOUNTAIN DESIGN.

S. P. C. A. Prize Goes to H. Van Buren Magonigle, Architect.

As the result of a competition designs by H. Van Buren Magonigle, the architect, for simple, serviceable drinking fountains for men, horses and dogs received the prize from the American Society for the Prevention of Cruelty to Animals, and was subsequently approved by the Municipal Art Commission. Permission was granted by the commis-



FOUNTAIN ERECTED YESTERDAY AT BRYANT PARK.

Fortieth street and Sixth avenue, by the American Society for the Prevention of Cruelty to Animals.

ation to have replicas erected at certain selected suitable points in the city already approved of by the Board of Aldermen.

The society yesterday, at a cost of about \$50, erected one of the fountains at Bryant Park, 40th street, just east of Sixth avenue. On one side of the bronze fountain, facing the street, is the horse bowl, and on the opposite side are the man and dog bowls.

The society has just erected a fountain of similar design to the Williamsburg plaza. It will be in operation next week. Another one of these fountains will soon be erected by the society at 71st street, Broadway and Amsterdam avenue. It has been paid for by Mrs. E. J. Post, of the Spencer Arms, and will bear this inscription:

"In loving memory of my husband, Elmer Jerome Post, and my daughter, Amy Louise Hatfield Clark."

The society will soon place a fountain, designed by John S. Humphreys, at 14th street and Broadway, the gift of St. Augustus Schermerhorn, and another in Fourth avenue, in the rear of Grace Church, which will be the contribution of a parishioner.

Fountains designed by William Singer will be erected at Coenties Slip, the gift of Frank K. Sturges; at Rutgers Slip, the gift of an anonymous woman contributor, and in Battery Place, the gift of F. Augustus Schermerhorn.

KAISER'S GIFT RECEIVED.

Busts Presented to the United States Military Academy.

By Telegram to The Tribune: West Point, N. Y., Oct. 24. All academic duty was suspended this afternoon in honor of the presentation to the academy by Emperor William of Germany of the busts of Frederick the Great and General Field Marshal Count von Moltke. The ceremonies took place in the main reading room of the library, the entire commissioned force of the post being present. Major Theodore Kerner, military attaché of the German Embassy, made the presentation in the name of the Emperor, saying:

"The German Emperor presents the busts to this great military academy as an expression of the highest esteem and friendship which he feels for the American army. May these busts be a

the Entwined, Det.

the Universal

here to-day

Reported

at

SPOT

Dr. W. H.

Dr. W. H. Health Dept. of the curative, or as good result in their face. Heved that

This enemy disease can give of per made in this results in the Vienna war

The work of the first told of loved the female of the serum. Dr. perimented

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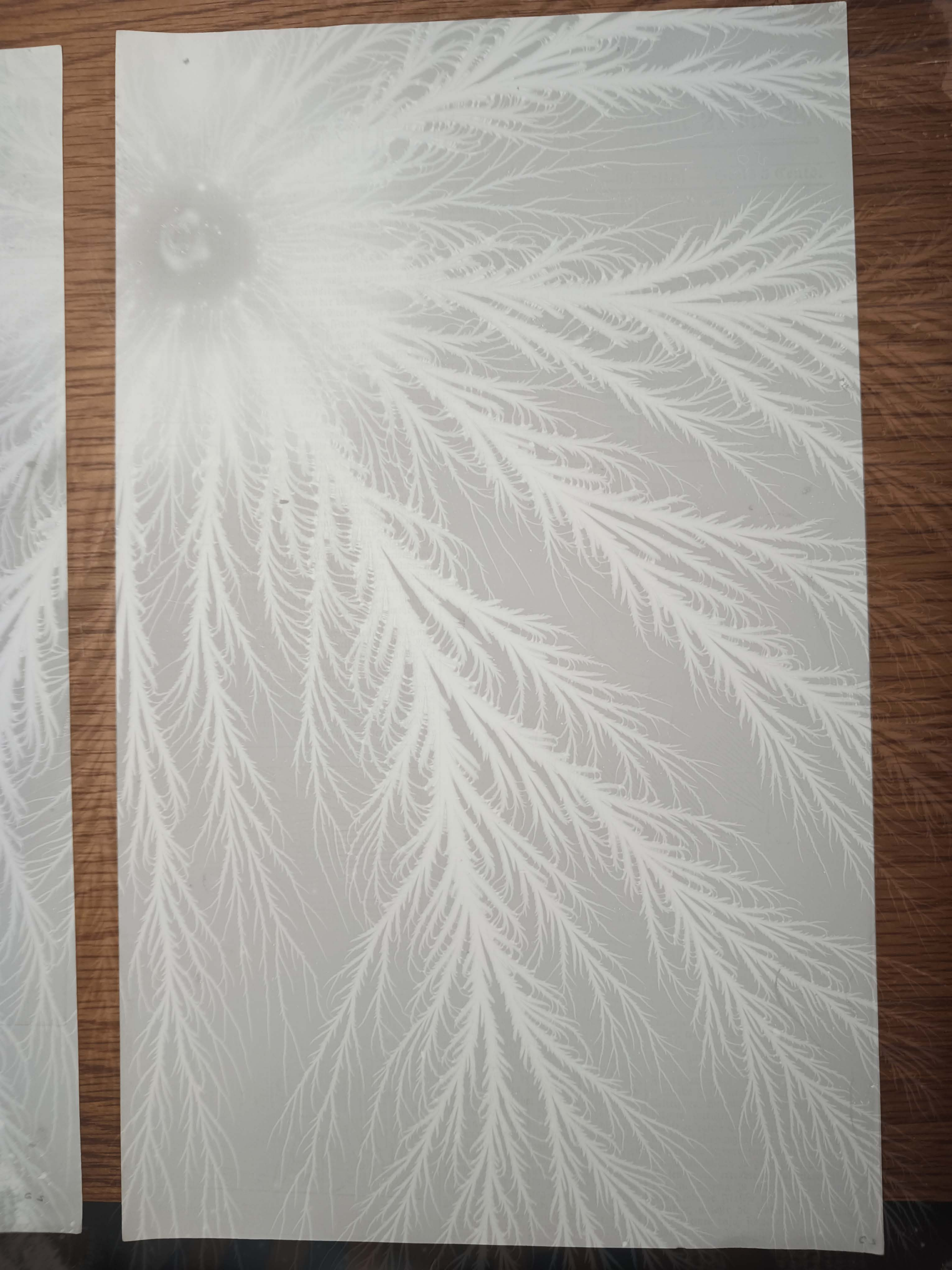
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NEW INVENTION BY
M. NIKOLA TESLA.

He Declares that He Has Found a
Perfect Electric Insulator.

New York, Friday.—The latest startling announcement of the inventor Nikola Tesla is that he has discovered a perfect insulation for electricity. He said to me to-day, when I called on him at the Waldorf-Astoria, that the idea was suggested to him by Professor Dewar, of the Royal Institute, in 1883. He had been working on it ever since, and had just obtained a patent.

The plan is by a chemical process to freeze a mixture of water and sawdust in a thin metal tube about the wire carrying the electric current. Mr. Tesla declares that electricity will in this way be transmitted from Niagara Falls to the Pacific Coast, or through the ocean from New York to London, with no perceptible loss of power. He asserts that the invention will greatly cheapen electricity, and cause a revolution in industrial affairs.—Daily Mail.

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Jahrgang 1895.

Neu



Sohn der Sonne.

Nikola Tesla, Edison's
großer Rivale.

„Macht Sonnenlicht.“

Ein Besuch in seinem Labora-
torium.

Elektrizität der Zukunft.

„Mutter, gib mir die Sonne.
(Ibels's „Gespensler“.)“

In den frühen Morgenstunden des 13. März verbreitete sich die Kunde von dem Brande des Tesla'schen Laboratoriums in New York. In der Nähe der Brandstätte, vor dem Hause No. 33 und 35 South 5. Ave., standen zwei Menschen und diskutierten die Tragweite des Ereignisses, als sich plötzlich ein junger Mann von etwa 35 Jahren unter allen Zeichen der fürchterlichsten Erregung einen Weg durch die Menge bahnte, um beim Anblick der rauchenden Trümmer fast zusammen-

Dramatic Fall stürzte der große Unglücks-
tlicher, hochragend
Hier befindet sich
das Reich Nicola

Die Schwierigkeit
auf Ellis Island
gegen die Schwierig-
entgegenstellen, der
großen Erfinders be-
gewöhnliche Sterblich-
laboratorium — wie ein-
bart's Geheimmach-
Wir aber sind keine
Sterblichen, wir fern
und dürfen eintreten.

Eine weite, hohe
vor uns aus, durch
eigenthümlichen, hell
den Schein, der sich
schein auf riesige
deren Glieder sich wie
Spensterarme hoch
Die endlosen Experimen-
Physik, der Chemie, der
mit allen ihren Neben-
vor unsern Augen hin-
scharfer Drogenrauch
Raum.

Wir wissen, die gewaltigen Maschi-
nen sind zweifellos elektri-
nen, die hohen, mit
Glasgefäße, aus denen
genen Stangen mit
Kugelspitzen reden, für
schen — in ihrer An-
geradezu lebensgefä-
lig unbegreiflich aber
einige andere Wor-
steht ein ungeheures
Gefäß, in das, wie
aus verschiedenen
sehle, mit Draht und
rathen ist. Schräg
Gefäß hängt eine große,
Zinktafel, über der
tung zu verbergen
Ausläufer wir einen
zu sehen glauben. Und
wie diese Gegenstände
noch mehrere in den
aufgestellte große,
ballons, deren Silber-
zende Strahlen aus-
Abends das den Raum
magische Licht noch
Es ist eine veritable
Wer wäre da nicht neugierig
und Treiben, dem Wesen
des Mannes, der hier
ein moderner Zauber-
wie ein moderner Al-
ganzen, gewaltigen
wissenschaft experimentell.

Nicola Tesla wurde vor 37 Jahren
in Smiljan, einem serbischen Dorf von
etwa 40 Häusern, geboren. Er ist 6
Fuß hoch, seine Gesichtszüge zeigen
auffallend den slavischen Typus, nur

die untereinander verbunden und mit
dem elektrischen Strom in Verbindung
gebracht sind; ein elektrisches Wellen-
meer durchflutet jetzt den Raum.
Dann nimmt er eine (Glas-)
röhre zur Hand — und sie beginnt zu
leuchten. Und er selbst leuchtet. Aus
jeder Pore bringen ihm bläuliche Flam-
men, aus jeder Fingerspitze, von jedem
Haut hervor blühende bläuliche Strahlen;
er sieht aus wie der leidenschaftliche Luci-
fer. Einer, dem dies Experiment un-
geheuer imponiert hat, ist Prinz Hein-
rich von Preußen, der es gelegentlich
einer Vorlesung in der „Alcancia“ in
Berlin selbst an sich probiert.

Wer eine Erklärung dieser Experi-
mente verlangt, der wird von Tesla
zunächst mit Zahlen regaliert, die einen
Durchschnittsmenschen geradezu zer-
schmettern müssen.

Man nehme eine 5 und hänge vier-
zehn Nullen an, das Resultat wird eine
Zahl sein, die folgendermaßen aussieht
500,000,000,000,000. Diese Zahl
stellt nach Tesla die Anzahl der
Schwingungen im Aether per Sekunde
dar; Alles, was er zu thun hat, um
Sonnenlicht auf der Erde zu erzeugen,
ist, die gleiche Anzahl Schwingungen
in der Sekunde hier zu erzeugen. Das
ist das ganze Rezept, ungeheuer einfach,
nicht?

Tesla hat indessen noch andere
Pläne. Er will ohne Leitung durch
die Erde telegraphiren. Vorher muß
er nur noch messen, wieviel Schwin-
gungen per Sekunde durch Ableitung
der in der Erde enthaltenen Elektrizi-
tät entstehen, um hier die gleiche Anzahl
Wellen zu erzeugen.

Nicola Tesla war es, der vor einer
großen Versammlung in Philadelphia
eine Viertel Millionen Volten durch
seinen Körper leiten ließ. Damals
rief er voll Stolz aus: „Man gebe mir
eine Million Volten und ich schaffe eine
Sonne.“

Jener griechische Jüngling — Phaeton,
glaube ich, hieß er — welcher be-
famlich auch Sonnenlicht erzeugen
wollte, steckte bei seinem Versuche die
Erde in Brand und wurde dafür von
Zeus mit dem Blitz erschlagen. Ein
Sohnesohn des 19. Jahrhunderts
fürchtet keinen Blitz mehr. Er gedie-
let ihm, wie der Sonne. Eine Viertel
Million Volten! Zur Hinrichtung
der Mörder in Sing Sing genügen
nicht ganz 2000 Volten.

Elektrizität der Zukunft.

Wenn Tesla über seine Projekte
spricht, wird er hochinteressant: Ich
will taun man verstehen. Er theilt
die Zeit in Billionen einer Sekunde,
spricht von überhaupt nicht wahrnehmba-
ren Kräften, die groß genug sind, um
sämmliche Arbeit in den Vereinigten
Staaten zu thun, und kommt endlich
zu dem Schluß, daß die sociale Frage
durch Elektricität gelöst werden wird.

Tesla ist stolz auf seine slavische
Abstammung. Er glaubt, daß die
Schöpfungen slavischer, speziell serbi-
scher und croatischer Dichter die Welt
in Erstaunen setzen würden, wenn sie
in einer guten Uebersetzung bekannt
würden.

Er ist ein großer Verehrer der Freu-
den der Tafel. Er erzählt, er verspüre
die tröstliche Wirkung einer guten
Mahlzeit schon 20 Minuten nach V-

Wird
in's
Sing
berzei-
dan an
Welt
diesen
Deutsch
befande
Deutsch
der und
ten, die
standen,
Des
ist besch

sehen u
größeren
der hat
bund en
das heut
großen
des ihm
stehen.
Hohen
Septemb
von rief
hat sich
was er
schafft.

CS

Tesla - Scherff
Correspondence
(Marie Scherff coll.)

MISS : (copies)

1) Tesla - Schaff

2) ~~SRM/CWC~~

No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

INCORPORATED

21,000 OFFICES IN AMERICA.

CABLE SERVICE TO ALL THE WORLD.

The Company TRANSMITS and DELIVERS messages only on conditions limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after the message is filed with the Company for transmission.

This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, President and General Manager.

7:10 am

NUMBER

SENT BY

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CHECK

MS In 21 Paid

RECEIVED at

Dated

To

New York NY 11th July 12th 190
George Scherff
C. Tesla Marks M. Clyffe NY
Please mail her specifications transmission
and post Engage men to complete both trunks
soon. Tell Towne to be careful in tests
Tesla

Tesla
Scherff
Marks

Circus 1991

Dear Mr. Schuyt

Please do not forget

the first

time

when I was there

right in the middle

of the city. Hope to

have been there soon

Sincerely

Yours when
you are there

the Field

Mr. George Scherff

Tesla Works

Wardenclyffe

L. J.

His present knowledge
he may command with the
his

The Waldorf-Astoria
New York.

The Waldorf-Astoria
New York.

Aug. 9. 1902.

Dear Mr. Scherff,

Mr. Page has just told
me that my opponents
attorney has admitted my
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appears that Ferrienden
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anything beyond conceiving
the idea, and that only
long after I had practiced
it in many ways.

his present knowledge
 he may counsel with the
 invention in any way. It
 is, Dr. Page says - not of
 much consequence that he
 knew them and therefore
 he should only hold fast
 on the general facts. He
 will have to see Dr. Loren-
 son Tuesday morning and
 it is possible that we
 may find it better that
 he see him Monday evening.
 Oblige me by preparing
 Lorenson for this.
 I expect to go out either
 tomorrow or Monday but it
 is very likely that I shall return
 on the same day.

Dear
 Mr
 The
 me
 attorney
 prior
 appear
 did
 any the
 the id
 long
 it in

Sincerely
 W. T. T. T.

Mr. George Scherff
Tesla Works

Wardenclyffe
L. J.

The Waldorf-Astoria
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His present knowledge he may connect with the invention in any way. It is, Mr. Page says - not of much consequence that he know them and therefore I should only hold fast to the general facts. He will have to see Mr. Ferriss Tuesday morning and if it is possible that we may find it better that he see him Monday evening. I expect to go out either tomorrow or Monday but it is very likely that I shall return on the same day. Sincerely
L. J. Tesla



Now to say that his appli- to tell you that the
citations are defective and Page wants every possible
that he uses some of article which Trenchard has
my patented apparatus. published of any bearing
he must be disappointed however remote on the
of course and I am subject. Please do this
sorry for him although it is possible to know.
you know he has written to not overlook daily
some articles which were papers although they are
not very nice. of smaller importance.
I write first of all Lorenstein's testimony is not
because I know that is essential now but tell
would please you to tell him to collect in his
that my know as the thought is clear as possible
originator of the principle everything I told him and
is correct and also everything I did that with

Sept. 10. 1902.

Dear Mr. Scherff,

Important matters have made it impossible for me to return speedily as I expected and as Lowenstein may not have enough work for all the men I wish you would call his attention to a change I want to make in the hooking down lightless Transformers. The idea is to get all the ends of the lightless windings outside of the tank so as to enable us to make any connection outside. This will be necessary in some experiments.

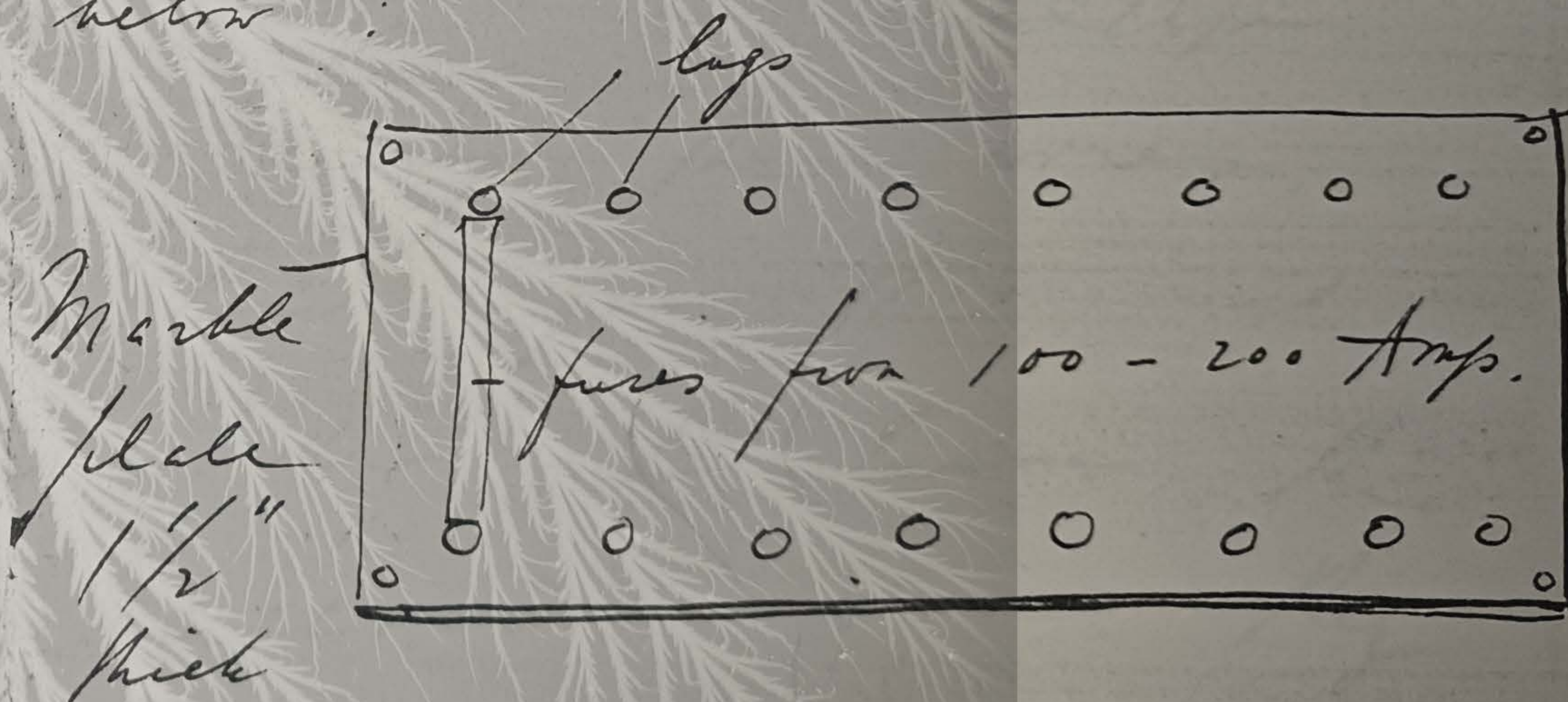
I propose to this end to do away with the present handles for turning the connections in the oil and also with all the paraphernalia on the top of the marble plate and make permanent connections through rubber rods or tubes as illustrated in enclosed rough sketch. For connecting we shall use either special beeing insulated wire or something else. This is for the present unimportant. Mr. Lowenstein should make a drawing of this scheme, but the rubber should not project much above the cover of the tank as we ought to get two such pieces out of one rubber bar. I think about $1\frac{1}{2}$ " rubber should be used.

Samuel N. Tesla

NY New York OK 7. 1902.

Dear Mr. Schuff,

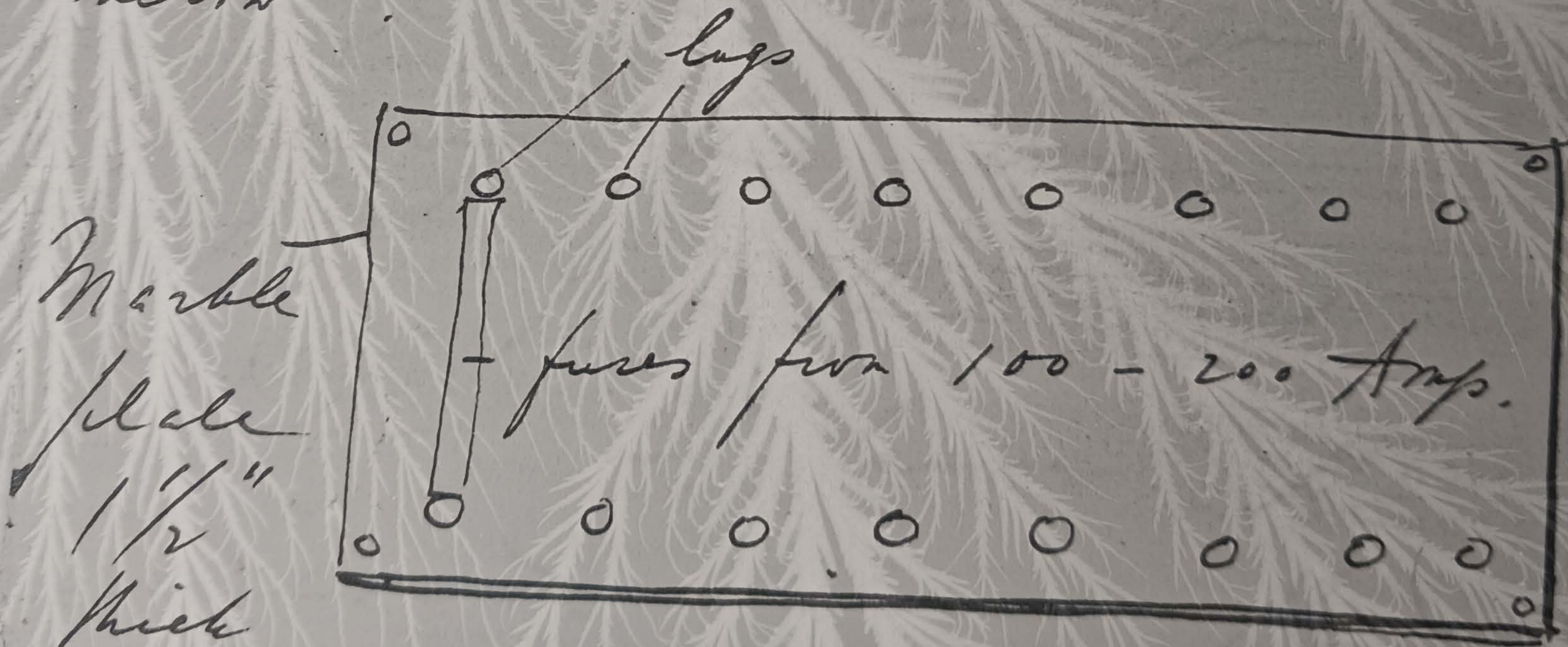
Please tell Mr. Lowenstein
that I have ordered for the
four phases from auto's to
have a Marble plate mounted
with 8 D.S.W. fuses as
below:



New York Oct. 7. 1902.

Dear Mr. Schuff,

Please tell Mr. Lowenstein
that I have ordered for the
four phases from auto's to
have a marble plate mounted
with 8 D & W. fuses as
below:



over

This perhaps can be to the profit in the
future to the well as laboratory might be con-
to the extent and I need around a fare,
think that Stevenson At any rate he will
may be able to adopt be able to use this
a plan of connection which knowledge to advantage
would make it easy to be planning the wires,
make in the laboratory is better to leave the
personnel of the cir- switchboards when they
cuts in the house. For are low.
instance the wires leading
Sincerely
V. Teste

Nov. 12, 1902

Dear Mr. Schuyler,

This to say that matters
are progressing to a ~~large~~ ^{good} extent
very well but of course
much to be done for me. I
am confident of ultimate
success but see still much
hard work ahead.

Please give ~~attention~~ ^{attention} to
the ~~enclosed~~ ^{enclosed} ~~letter~~ ^{letter}

I have

Truly

Yours

Friday Nov. 20, 1902

Dear Mr. Schmitt,

Sorry not to find you here. I understood that you were to go to town to-day and came out on this occasion.

Please when you are there ahead to following business delays.

Business delays are the same as before. I have moved as Mr. Schmitt read it. I do not understand exactly what he has said as I was in a position of being quite nervous. Calling on him in regard to

any business $\frac{1}{16} - \frac{1}{8}$ or even more

5/12 blades. Jackson 12" long.

Oblige of attending to this business if possible.

Yours

W. T. ...

American
Lumber Co.
A and Lane Lumber

P.S. I forward check under custom number. Please let you pay the money. They will have you at the Chester Bank.

Friday Nov. 28. 1902

Dear Mr. Schaff

Sorry not to find you
here. I understood that you
were to go to town today
and came out on this account.

Please show your
interest in the
protection of the
wild life.

I have been thinking
much of late about the
need of a law to protect
the birds and animals.

As the breeding season
is now over, the birds
are now making their
nesting places and are
very anxious to get away.

During the winter to come
quately many of the
birds will be killed.

Calling on you in the
winter.

1902

any thickness $\frac{1}{16}$ - $\frac{1}{8}$ " or even more
usually

5/12 black leather 12" long.

Objs of clothing to show to
arrow in front.

George

W. T. L.

American

Summer Co. ?

A. and C. Co.

P.S. I found chee
under melon. Showing

that you are not the
money. They will know

you at the Chester Bank.

March 5, 1903.

PS

Dear Mr. Scherff,

Prof. Barker of Penn. Uni-
versity Morgan Laboratory of
Physics asks me to loan
him one of my Lammont
photographs taken

with same.

I think that I have one
or two of these kinds left

(They are provided with an
Aluminum cap on the end
please note this) and

This subject. I refer to by
lecture at the Academy of Sciences.
There is a drawing showing such
a aluminium cylinder containing water.

5). I also saw you the end
the photograph (Ranger) of the
bones of a large man was
taken from the bone
by yourself as shown in the
photograph of the bone in the
other of the bone as shown in the
I shall be at University Monday
Evening at 7 o'clock

as I would like to oblige
Prof Barker very much)
am sending a message by
L. J. H. H. and bring
them to him in time for his
talk at ^{good or best} Dr. H. H. H.'s
Vesper's house in the evening
on Friday. The message
can take the lecture 40 Sec. and
will get here at 8.30.
Please send of all the letters
with aluminum cop of Rogers
photographs - I believe there are
21 of them small glass plates
about 4" x 4" I used to show

them frequently in my demonstration
in the laboratory and point out
that they were taken with
aluminum tubes (aluminum cups)
3) Date of my lecture before
N. Y. Academy of Science (I
think Nov. 6, 1896.) The
my subsequent report in a technical
paper. I think a volume has
contained in the Electrical Engineer.
4) My paper in the Electrical
Review dealing with this is particularly
clear. It was one of my
last - if not the very last contribu-
tion to that Journal on

Clark has made two hollow
iron cores of disks. These
ought to be insulated with
fibre and tape on top.

Mr. Merrell has made two boxes
for the two self-induction coils.
These should be mounted on top
of each of leading posts all
in a row and the iron cores
should be placed inside.
When the castings come (from pattern
Mr. Merrell made before I went away)
Mr. Beers should fix the two supporting
pipes etc. to lift heavy weights.

P.S. Status quo ante bellum *Ernest* N. Teller

April 14. 1900.

PS

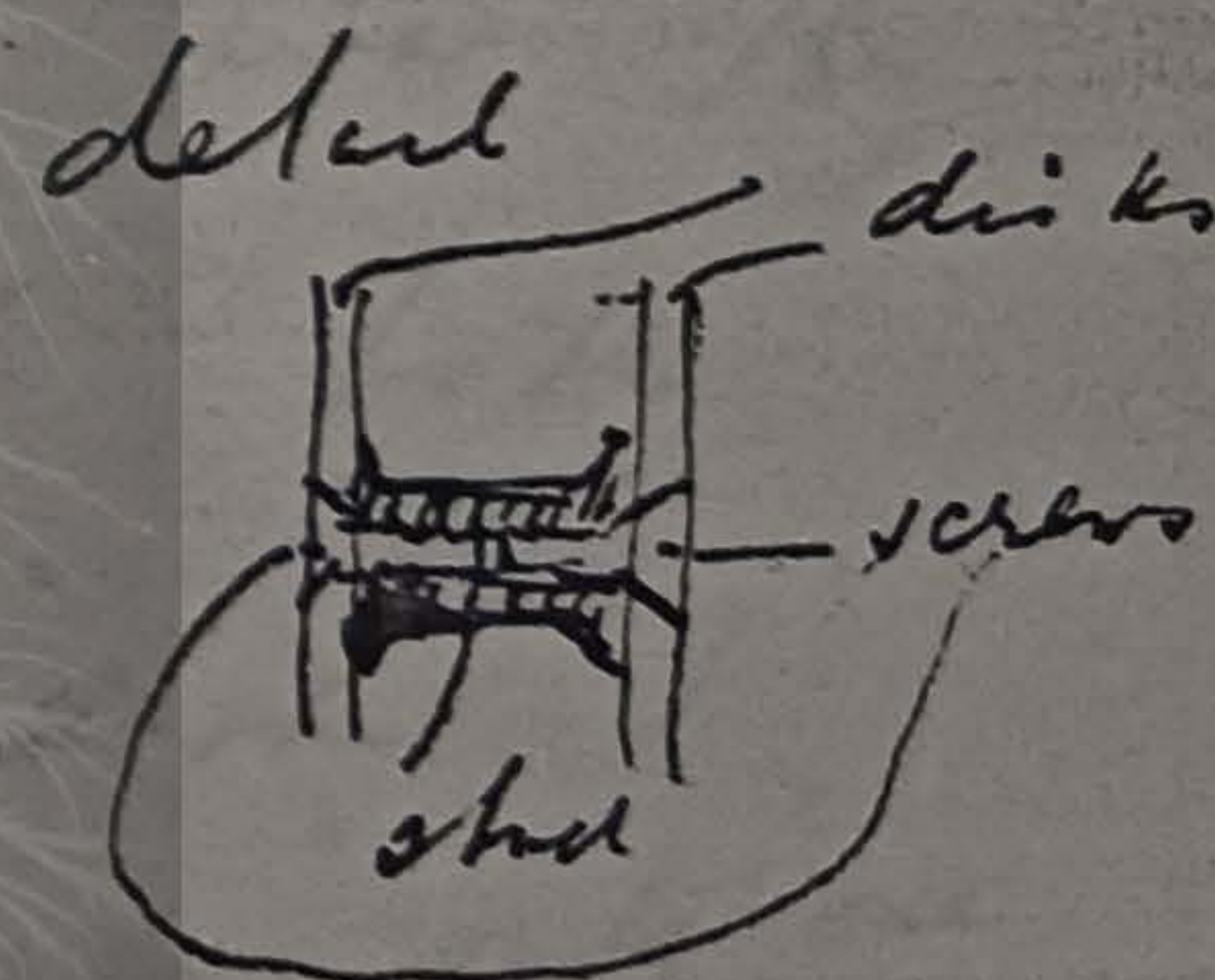
Dear Mr. Scherff,

Letter with pictures received.

I understand that Johnson
is straightening the disks. I
have explained to Hartman
that each pair of disks will
be joined by two studs and
screws diametrically opposite,

like this

a b
studs
and screws



April 14, 1903.

W

Dear Mr. Schuyt,

Letter with pictures received.

I understand that Johnson
is straightening the disks. I

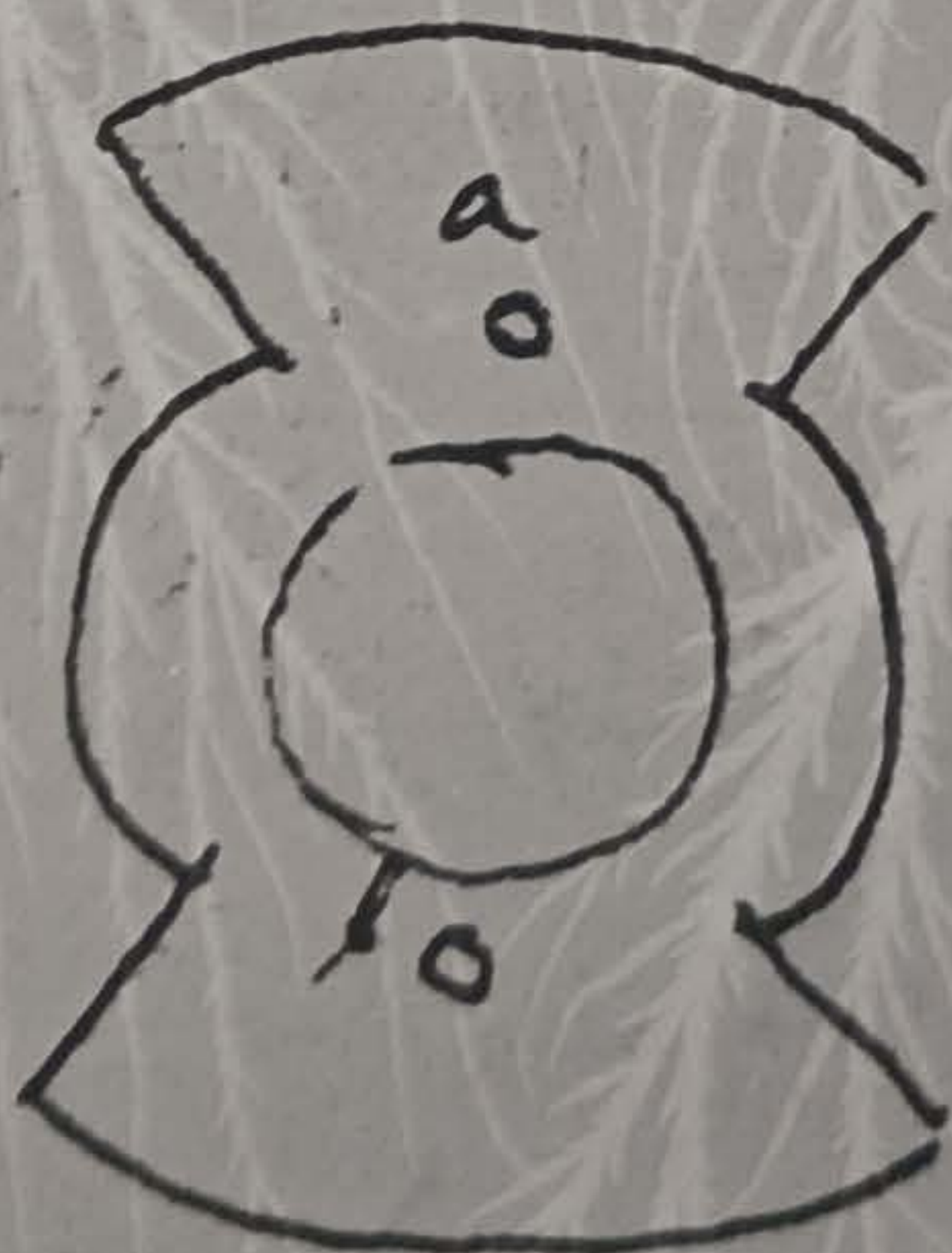
have explained to Hartman

that each pair of disks will
be joined by two studs and

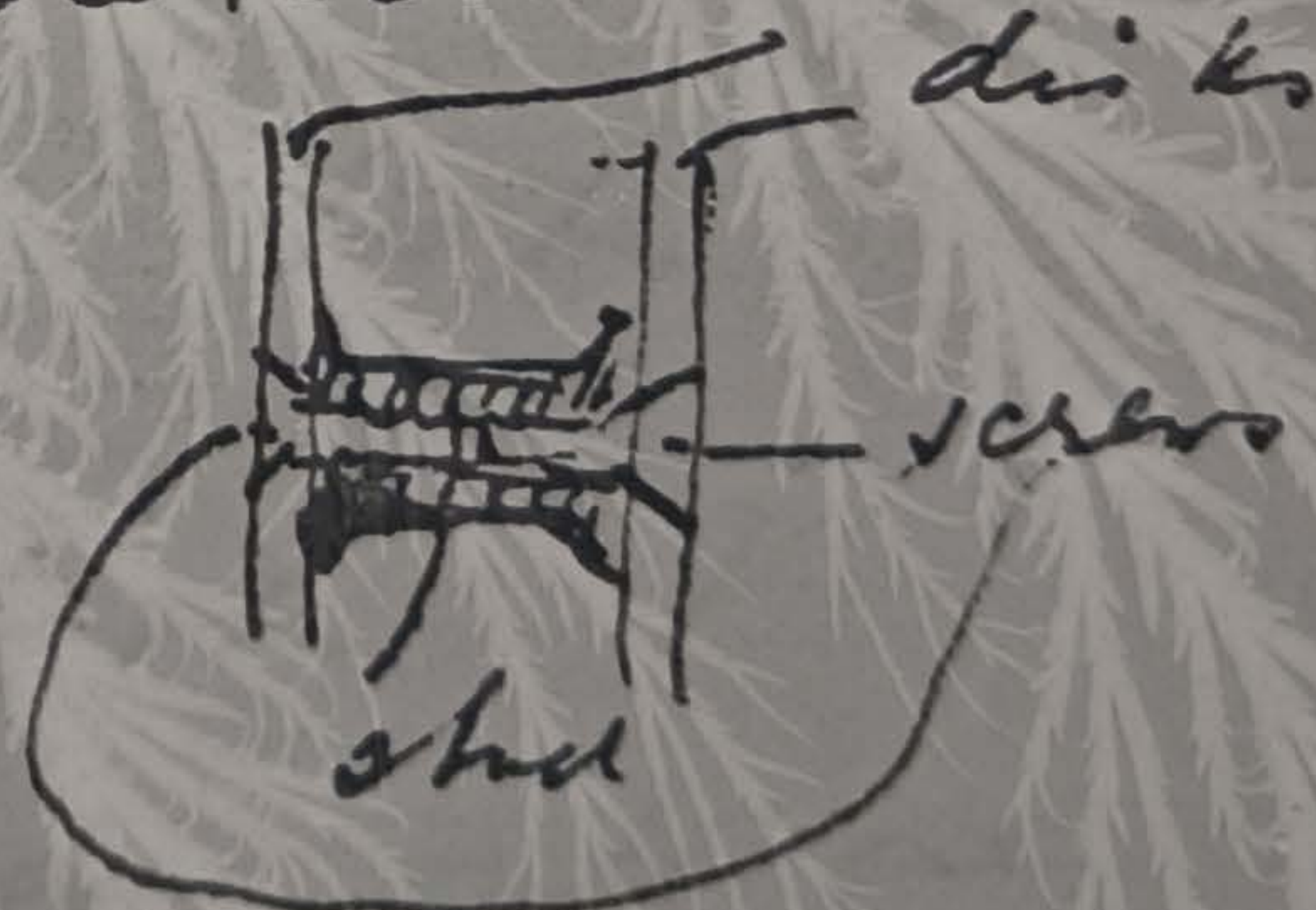
screws diametrically opposite,

like this

a b
studs
and screws



detail



Clark has made two hollow
iron cores of disks. These
ought to be insulated with
fibre and tape on top.

1. Murrelling has made two boxes
for the two self-induction coils.

These should be mounted on top
of each of binding posts all
in a row and the iron cores
should be placed inside.

When the castings come (from Jetterson
Mr. Murrelling made before I went away)
Mr. Beers should fix the two supporting
pipes etc. to lift heavy weights.

P.S. Status quo with bellum V. Fer

Please tell them that in
the new arrangement the
disks of each pair will
not be as at present
displaced by 90° but
will be placed exactly
alike (not displaced).

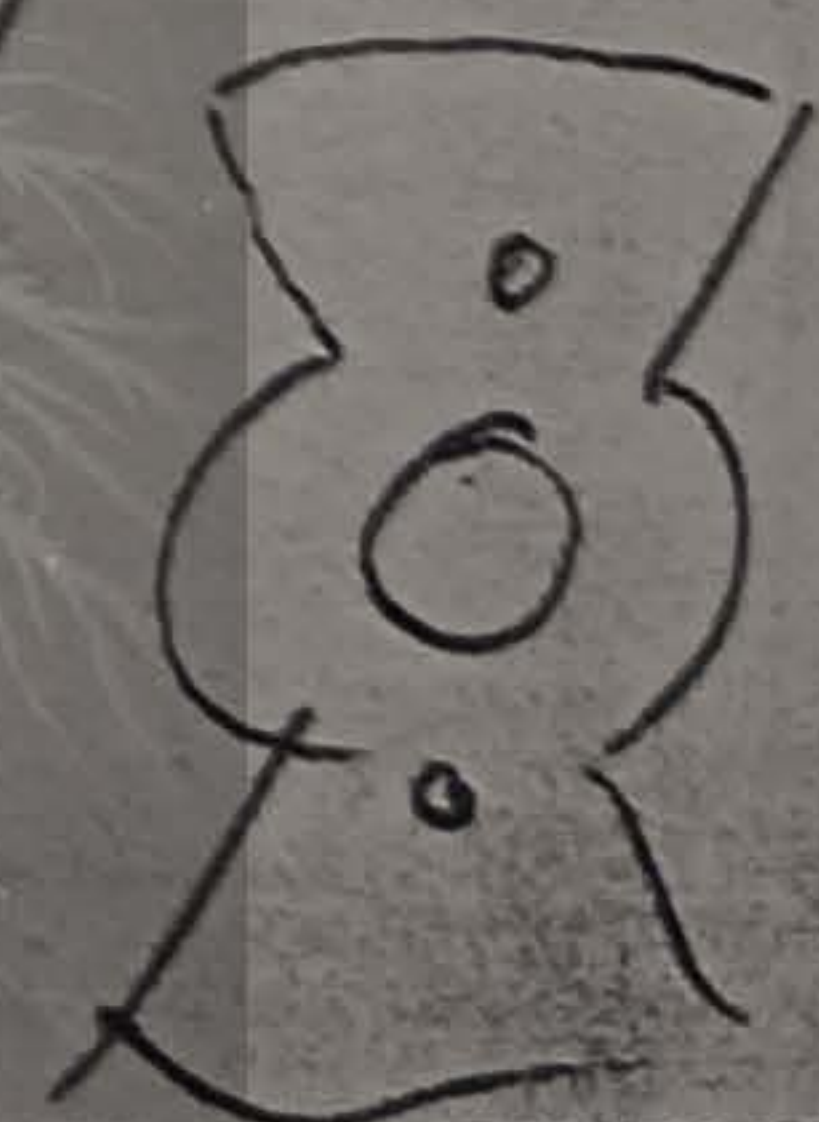
But the four pairs will
be displaced individually
exactly as before $22\frac{1}{2}^\circ$
one from the other

and in the same sense
as regards rotation. Mr.
Hartman will understand
this. To avoid mistake
I will say that the
disks of each pair were
before like this:



but now they
will be like
like disk 1

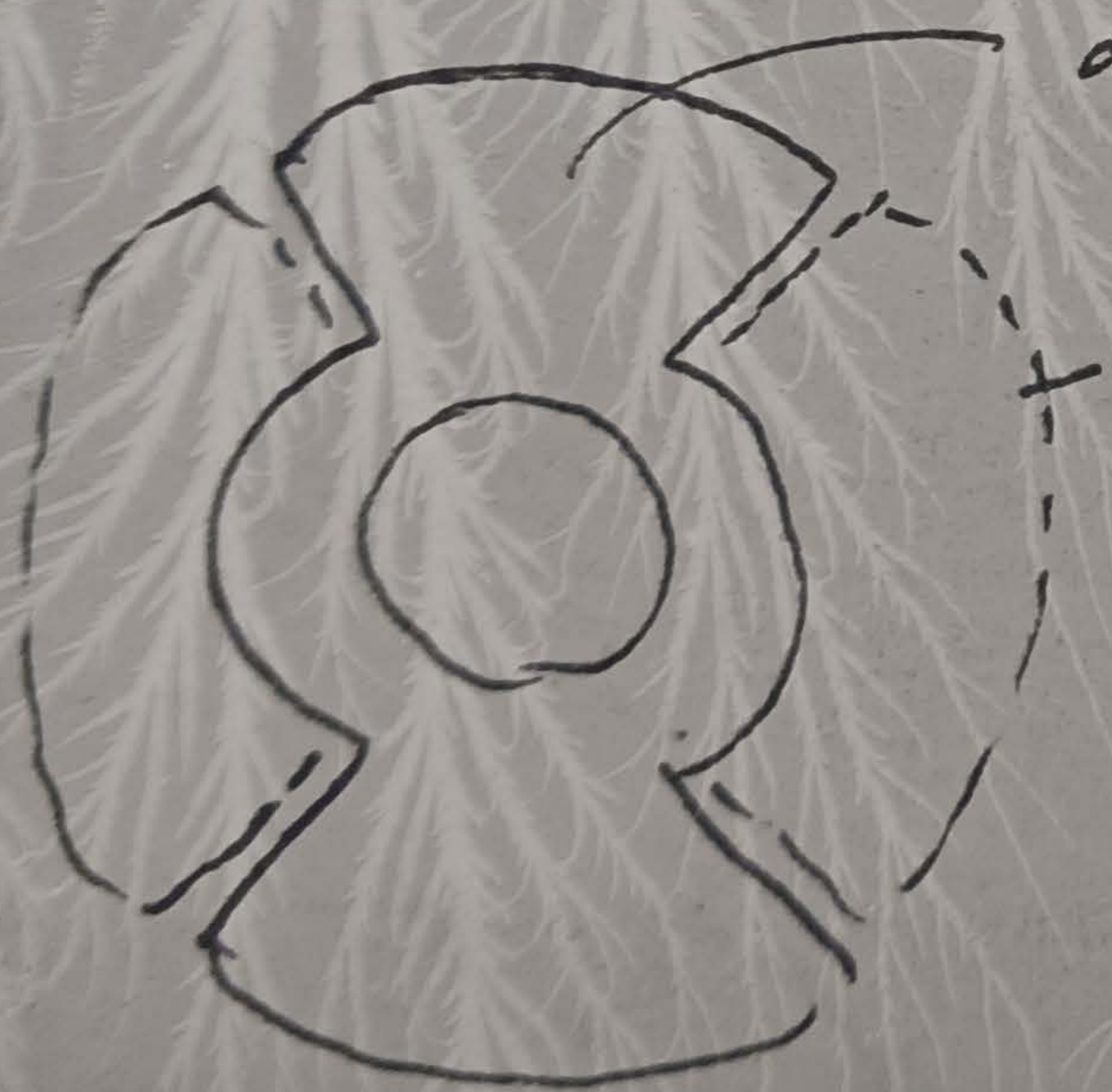
Looked from side only one
will be
visible



Please tell them that in
the new arrangement the
dots of each pair will
not be as at present
displaced by 90° but
will be placed exactly
alike (not displaced).

But the four pairs will
be displaced individually
exactly as before $22\frac{1}{2}^\circ$
one from the other.

and in the same sense
 as regards rotation. Mr.
 Hartman will understand
 this. To avoid mistake
 I will say that the
 disks of each pair were
 before like this:



disk 1

disk 2

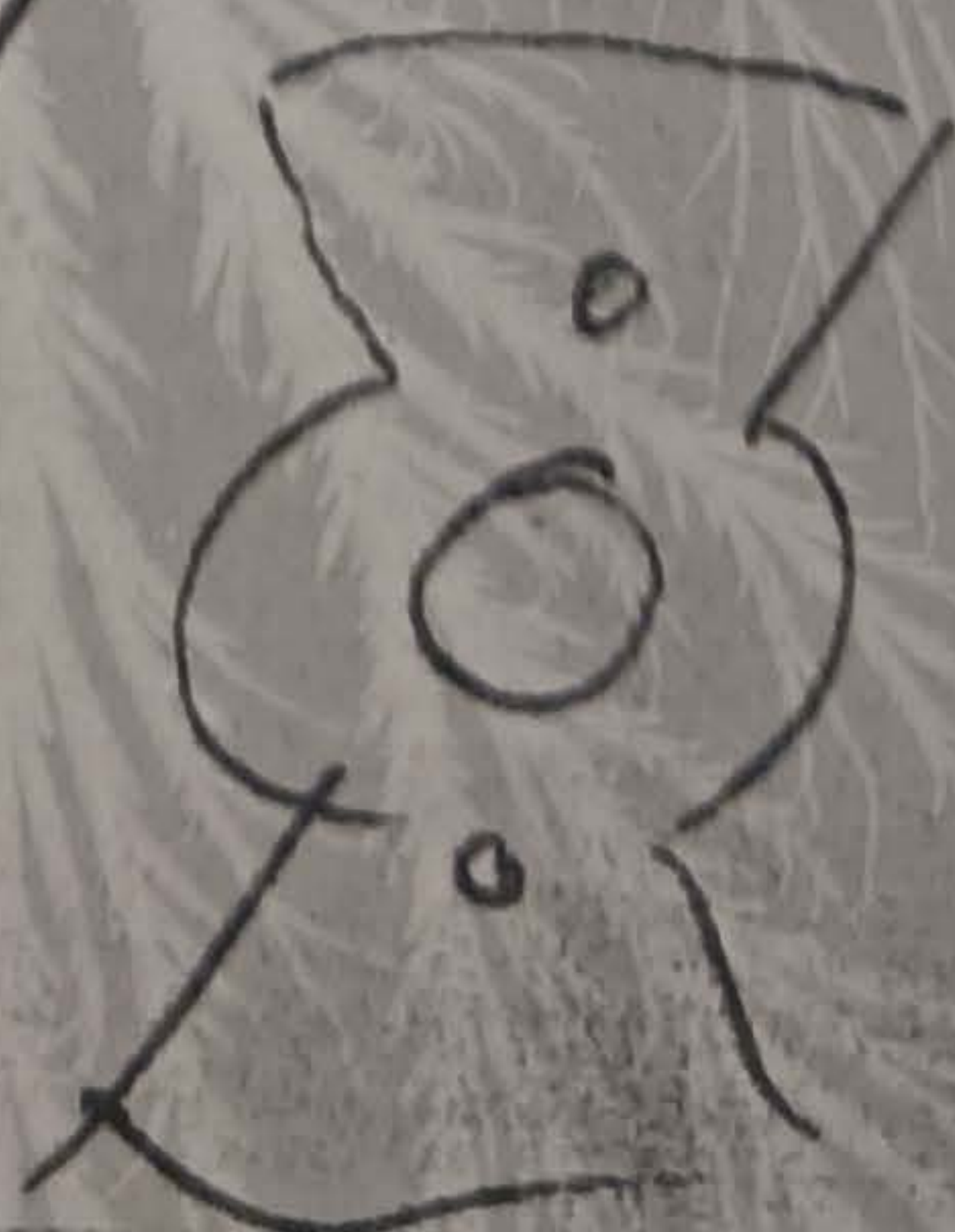
but now they

will be both

like disk 1

Looked from side only one

will be
 visible



DICKSON D. ALLEY,
FORMERLY OF LONNELL & CO.
ART PHOTOGRAPHER,
12 EAST 15TH STREET, NEAR 5TH AVENUE,

Paintings, &c., copied by the Isochromatic Process.

New York May 26 1903

Dear Mr. Alley,

Sorry I missed you. I was your to
take the snaps at my place from the rail-
road track so that the chimney of the building
is just in the center of image. From a
previous photograph taken by one of my
assistants it was seen that the building
could be obtained by placing the camera
not quite on the ground. The camera felt
from a track to the building but considering
closer to latter. The camera is my opinion
should be about 100 feet from the
ground, but this may not be necessary.
Please when taking this principal view
the that the doors of the building are
with open and the door of the workroom
is closed and that the building in
front of workroom appear symmetrical with
respect to door. Also observe that all
the windows are down and that the workroom

[illegible]

in place of my old one
as to secure a good photograph
between his eyes and the camera
about this to the Schenck. Two papers I
may be taken.

In addition I would like to take a
view of the tower above. Then my
be done from behind and placing the
camera just in front of the small
house. Of this one will be enough
You will probably have some places left
and in this case it seems as the
laboratory may be taken - I mean view
of that part which is attached to the tower.
About this Mr. Schenck knows also. You can
go to lunch to my place or to his and if you should
find it necessary stay over. Please let me hear

10 x 12
8 x 10
Then view as if from a shop and
as near as possible. Had better
be satisfied.

The Smithy excellent develop
 today. It is as good as
 what we can say. It says
 of the best of the Smithy
 going to be found and I shall
 have a quantity of the same
 10000 ft. of the same. This
 time to put it through but
 I am trying to do it by the
 present chance on the very new
 apparatus by word of mouth.
 The chief thing thought for the same
 is to meet the present difficulty.
 I am sure it will be very helpful.
 I expect to come out Sunday.
 Sunday 11th

July 30. 1903.

Dear Mr. Scherff,

Will you please have Clark
 and Arthur to Johnson to
 make a list of machines that
 we can place in the shop in
 addition to those on hand.
 Two of the same tools should
 be placed as I suggested to
 Mr. Johnson. We will remember
 one on each side of the door.

B

July 30. 1903.

Dear Mr. Scherff,

Will you please have Clark
and Hartman to ~~draw~~ ^{draw} to
make a list of machines that
we can place in the shop in
addition to those on hand.
Two of the same tools should
be placed as I suggested to
Mr. Hartman. He will remember
one on each side of the door.

[illegible]

This change could be made
now while there is not much
to do.

I expect to begin the new
line of millinery. I want a
small scale. This is the
best that can be done. I have
carefully thought it over. I
must absolutely provide a revenue also in that way
and the only way to do this
is to be imperative. I think
Mr. Moon will give me the
additional machinery (confidentially)
I talked it over with him and
he will do it. What I think

is right to be in such
a hurry. Please have
the new line ^{moving} running.
He should
be doing
it. I have
2000 worth
of
millinery
which
is
needed
at
once
and
as
soon
as
a
check
is
sent
I
shall
be
able
to
leave

This change could be made
now while there is not much
to do.

I expect to begin the campaign
here of millions of copies on
a smaller scale. This is the
best that can be done. I have
carefully thought it over and
must absolutely provide a revenue
and the only way to do this
is to campaign. I think
Mr. Brown will give me the
additional machinery (confidential)
I talked of and will do it as
he will do it. What I think

the
be only 4 hours and
latter mostly. Please have
the same book now running
the same Catalogue. He should
also have every list of goods in
the book. For a week
the book is needed
also in the present Catalogue.
as well as in a
type writer book. This is
from the Mr. Rogers.
You will be pleased to have

NEW YORK CABLE ADDRESS, "BOLDT NEW YORK"
PHILADELPHIA CABLE ADDRESS, "BOLDT, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court



THE ASTORIA

New York Aug. 17 1903

Dear Mr. Schefft,

Your letter of this morning has
just reached me.

You know, of course, that when
his pencil came on, great many estab-
lishments simply dismissed their men.
A dozen manufacturers stopping here
have told me that they did this. These
I think, should understand that I have
tried to put them generously in the
harshest lines this country has known
and they should be grateful instead

of being impatient. I have sent
one of my relatives to Europe for
money and if things go well I
shall get a sum of money by cable
before this week is over. The
question is whether he will be able
to send by cable. He is in the
it will probably be the same
so soon to Borneo which means a
delay of about four days. As
for the immediate and is concerned
in absolutely depending on my relatives
for it. The panic is practically over
yet. The feeling of apprehension is
still acute. A number of things,
however, are developing here and
may at any moment lead to a solution
of the problem which confronts me.
I can more than ever convince that nothing
can prevent my ultimate success. Please give
your excellent intelligence but you can in
the interest of the cause, my 'Sincerely' W. F. O. L.
suffering of intense.

Make sure plate carrying binding
is from omitting the
plug. It is not necessary.

The rubber column should be
about $1\frac{1}{2}$ " higher. Then

same column may be used by
putting on a piece of ^{or rubber} ~~or~~ ^{on the}
bottom, long screw may be
used to ~~lighten~~ ^{tighten}
to the two brass pieces.

Repair entire back mechanism
new plate and pieces if necessary.

The wire from secondary coil should
be thicker and well insulated. This
will make necessary to drill one
the rubber stems longer or make
two ones. Examination and do not
make up new ones to go in.

Everett W. Tarkenton


The Waldorf-Astoria
New York.

Nov. 16. 1903.

Dear Mr. Scherff,

I forward this afternoon
small oscillator to be repaired
as follows:

The fibulation on which the spool
is wound should be replaced
by thin german silver sheet or,
if no german silver is on hand, by
brass sheet (tube) wall say $\frac{1}{32}$ ". Of
course the sheet bent or tube should
not be closed but open like this

 This opening $\frac{1}{16}$ " should be
turned towards the primary
copper coil on back. The


The Waldorf-Astoria
New York.

Nov. 16. 1903.

Dear Mr. Scherff,

I forward this afternoon
small oscillator to be repaired
as follows:

The fabric tube on which the spool
is wound should be replaced
by thin german silver sheet or,
if no german silver is at hand, by
brass sheet (tube) wall say $\frac{1}{32}$ ". Of
course the sheet bent or tube should
not be closed but open like this

 This opening $\frac{1}{16}$ " should be
turned towards the primary
copper coil on back. The

Carefully (inner metal tube insulated with

micenta paper
look out in the
corners!

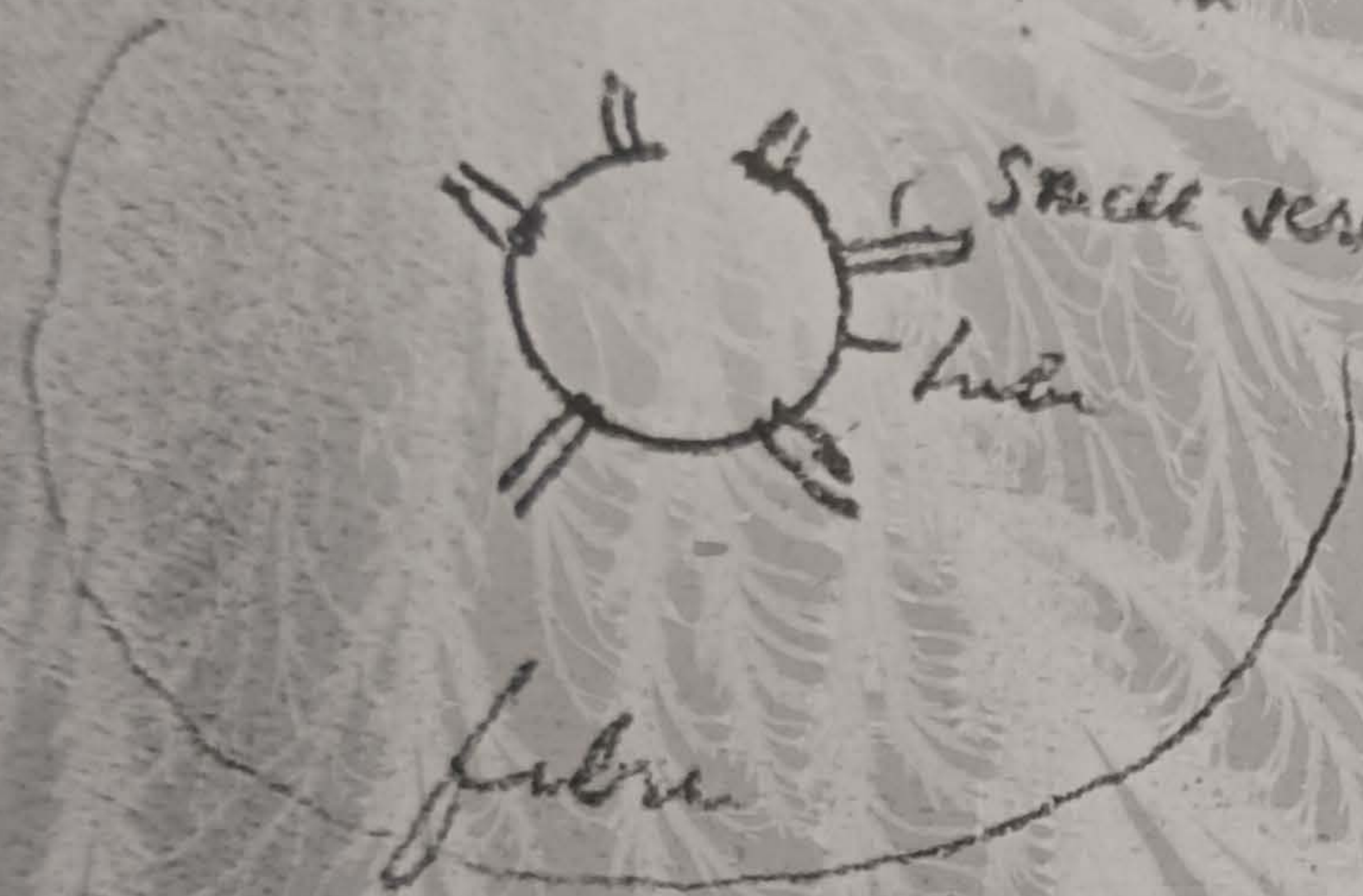
Of course iron core inside
should be made so much
longer so the coil is higher
through the lengthening of the
tube carrying the fibres.

I believe the top fibre should
be changed. Screws fastening
the brass pieces on top should
be larger than flat brass

Note: Iron core inside should
be kept away from metal tube
surrounding it by small fibre

of iron core
O - brass pins

metal shell or shocked tube will
 be fastened to the two fibre discs
 from the inside of the shell. This

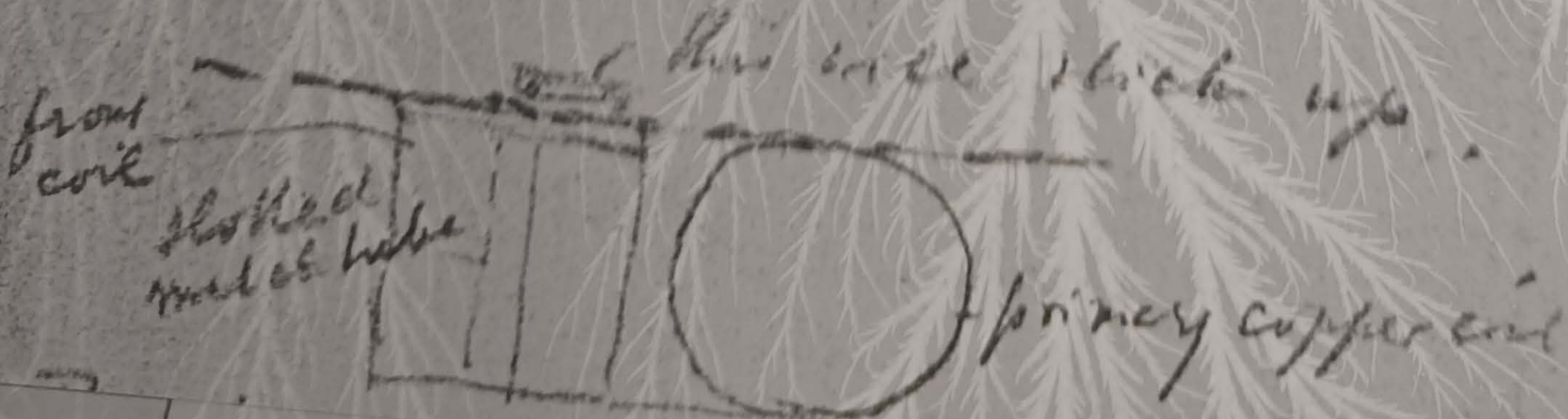


Shell screws not sticking
 out inside.
 Shell may be
 1/2 inch thick.

If con
 should
 longer
 through
 tube carry

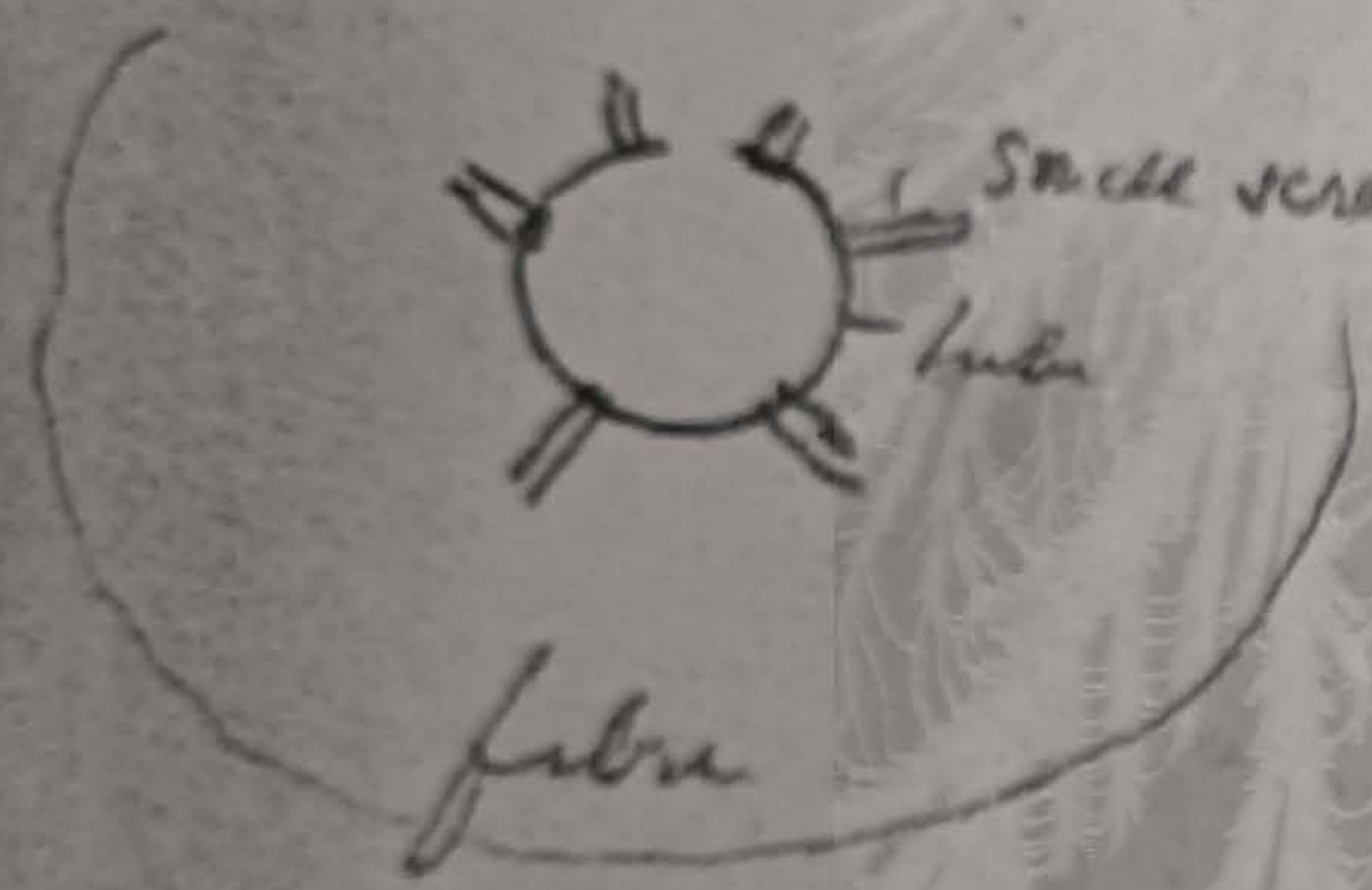
Now the metal tube should be
 made longer than the fibre tubes
 to be replaced about 1/2" so
 that the top of the front end will
 just be on a level with the
 top of the primary copper coil
 like this

I believe
 be cheap
 the front
 be larger



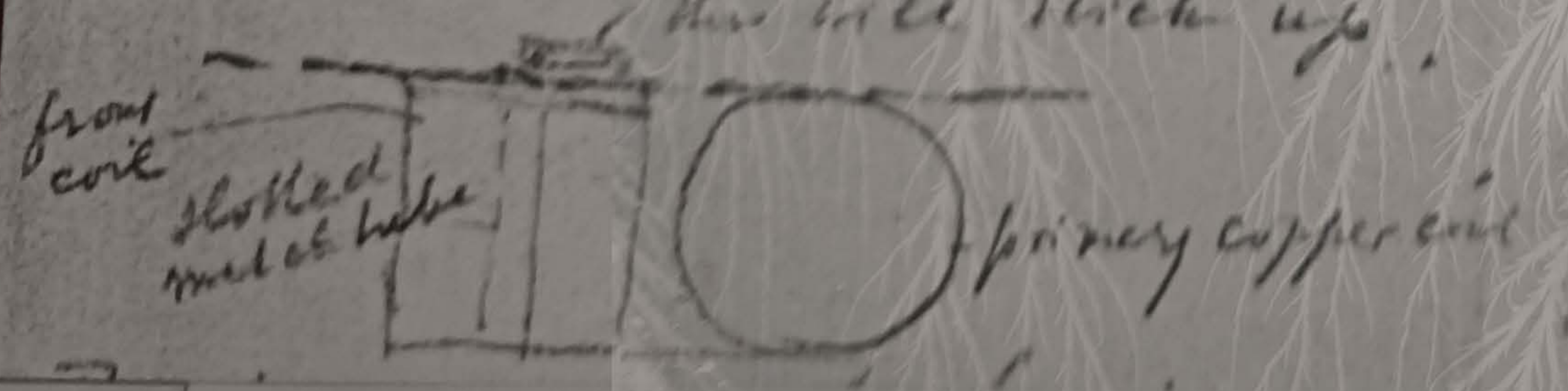
Note: This
 be kept
 surrounded
 by air

metal shell or slotted tube will
be fastened to the two fibre discs
from the inside ~~and the~~ this



small screws not sticking
out inside
shell may be
inserted

Now the metal tube should be
made longer than the fibre tubes
to be replaced about $\frac{1}{2}$ " so
that the top of the front coil will
not be on a level with the
top of the primary copper coil
like this

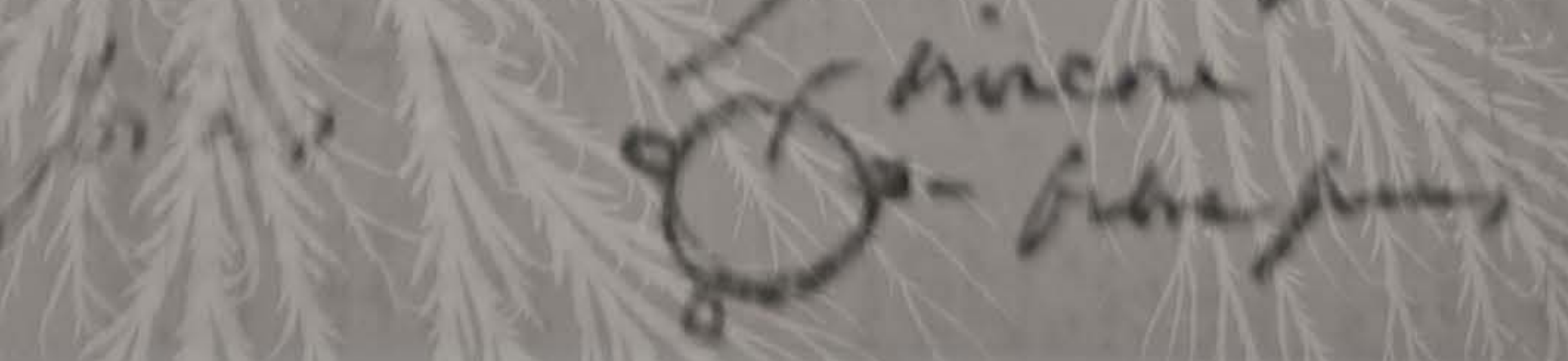


carefully (inner metal tube insulated
with
mica paper
look at in the
corners!)

Of course iron core inside
should be made so much
longer as the coil is higher
through the lengthening of the
tube carrying the fibres.

I believe the top fibre should
be changed. Screws fastening
the brass pieces on top should
be larger these get loose

Note: Iron core inside should
be kept away from metal tube
surrounding it by small fibre.



Make sure plate carrying binding
posts is properly omitting the
plug. It is not necessary.

The rubber column should be
about $1\frac{1}{2}$ " higher. The

same column may be used by
putting on a piece of ^{or rather} ~~rubber~~
bottom, long screw may be
used to ~~tighten~~ ~~the~~ ~~column~~
to the two brass pieces.

Repair entire back mechanism
new plate is ~~pieces~~ if necessary.

The wires from secondary coil should
be thicker and well insulated. This
will make necessary to drill one
the rubber stems larger or make
two ones. Examination on diagram and
make up new one to go in.

Everest N. T. Fisher


The Waldorf-Astoria
New York.

Nov. 16, 1903.

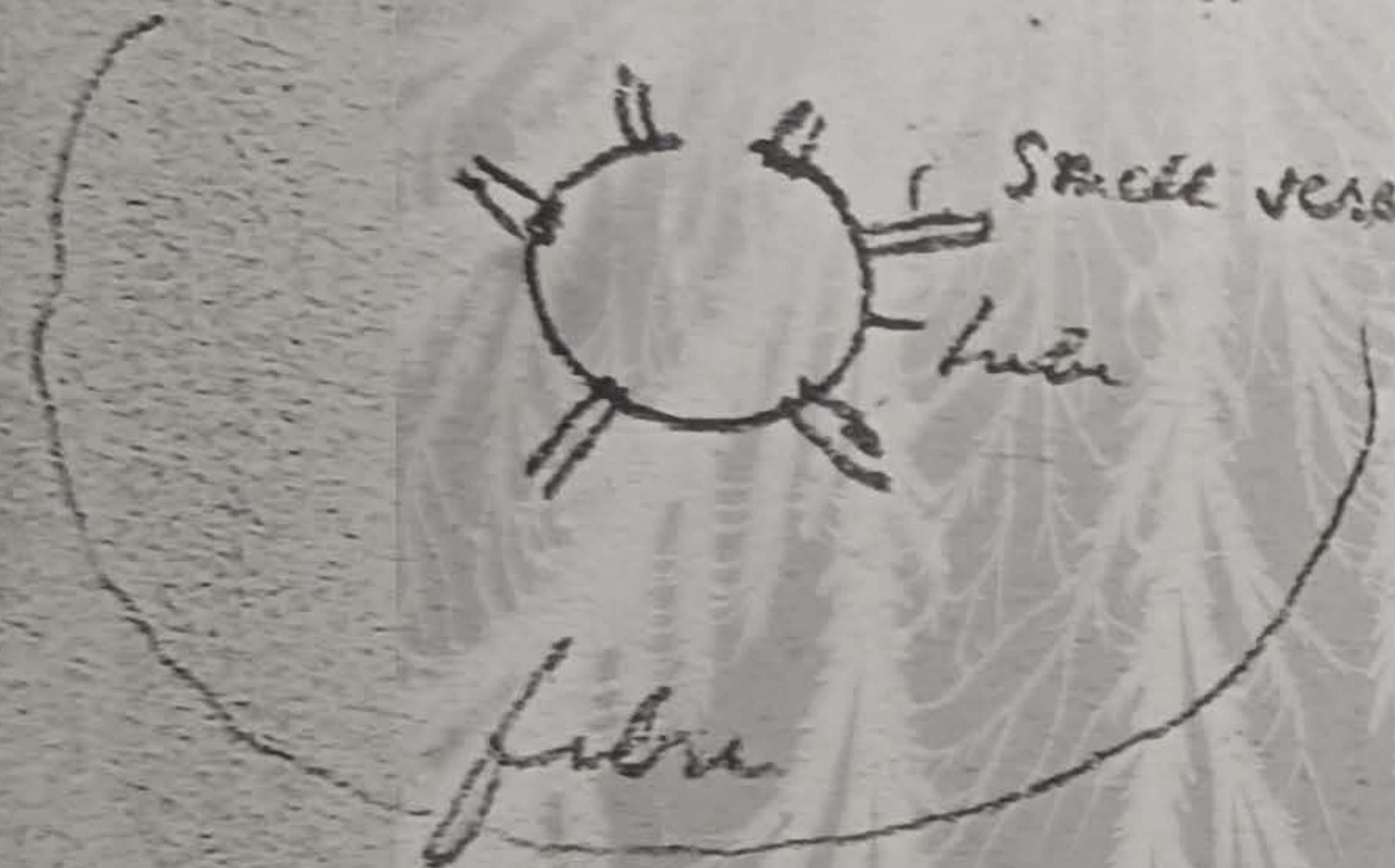
Dear Mr. Scherff,

I forward this afternoon
small oscillator to be repaired
as follows:

The fibrelute on which the spool
is wound should be replaced
by thin german silver sheet or,
if no german silver is on hand, by
brass sheet (tube) wall say $\frac{1}{32}$ ". Of
course the steel bent or tube should
not be closed but open like this

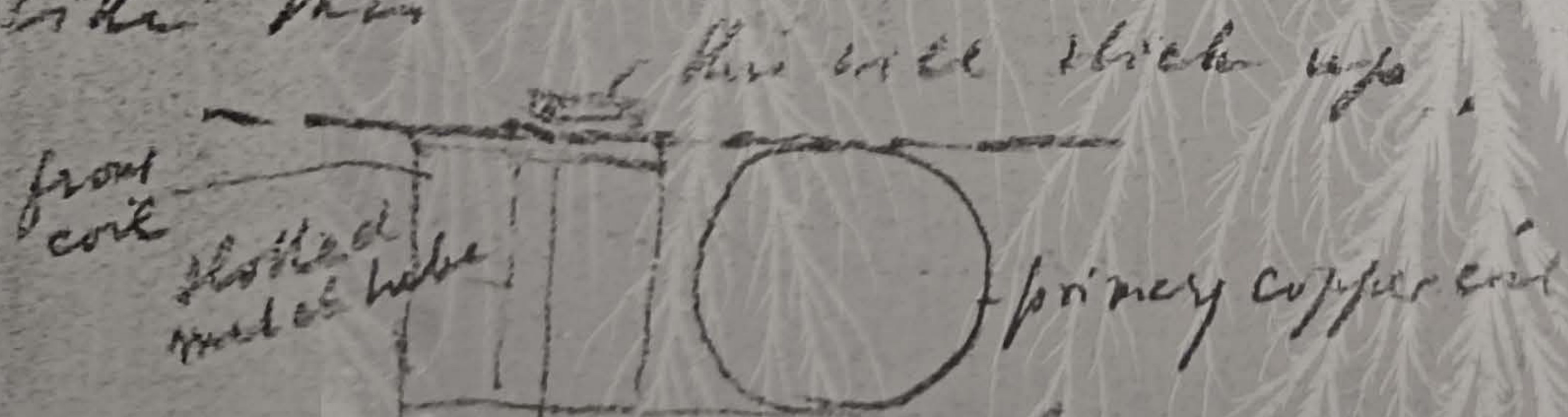
 This opening $\frac{1}{16}$ " should be
turned towards the primary
copper coil on back. The

metal shell or slotted tube will
be fastened to the two fibre disks
from the inside. ~~needed to hold~~ this



Small screws not sticking
out inside.
Shell may be
insulated.

Now the metal tube should be
made longer than the fibre disks
to be replaced about $\frac{1}{2}$ " so
that the top of the front coil will
just be on a level with the
top of the primary copper coil
like this



carefully (since metal tube insulated
with
mica paper
look at in the
corners!

Of course iron core inside
should be made so much
longer so the coil is higher
through the lengthening of the
tube carrying the fibres.

I believe the top fibre should
be changed. Since following
the brass pieces on top should
be larger than the old core

Note: Iron core inside should
be kept away from metal tube
surrounding it by small fibre



are having me
long but's make

The Waldorf-Astoria
New York.

You are right it is
perhaps wonderful
how blind people are
Today the person came
from Europe to the
city to do something
I expect to look them
up to morning

P.S.

Sam

I am writing in pencil following
theory of my friend Crookes who holds that

Apr. 18, 1903,
Mr. Schuff,

I sent message by
telephone today to
Chapman with
one size thicker.

Please tell Alfred to
work very carefully as
many things are possible

no paper between layers
that is like an egg.

should be
146
mural boards

The Waldorf-Astoria
New York.

Nov. 18, 1903.

Dear Mr. Schuff,

I sent message by
telephone today to
be met charging with
one wire. Thanks.

Please tell Alfred to
work very carefully as
many ~~things~~ things are possible.

No paper between layers
holds that is taken very carefully.

Turned 116 should be
charging cord on back. The

P. S. I. B. on

have having one more
long letter to write

You are right it is

interesting to read

the letter from

the family

and the letter from

the family

I expect to see them

in the morning

please

write

I am writing in pencil following

the name of my friend Crocker who helps me to

except on the legs
before ~~at~~ ^{the} ~~the~~ ^{the}
under ~~is~~ ^{is} all right.
The ~~under~~ ^{the} ~~the~~ ^{the}
be put together as soon
as possible ~~changed~~
in all particulars
as ~~suggested~~ ^{suggested} in
previous letters.
You need not change
the platform entirely, unless
necessary.
I would be glad to

make the arrangement
of ~~the~~ ^{the} ~~the~~ ^{the}
a ~~general~~ ^{general} ~~the~~ ^{the}
to provide a few ~~the~~ ^{the}
which may be
desired.
There are some of the
and ~~the~~ ^{the} ~~the~~ ^{the}
I believe that
the ~~the~~ ^{the} ~~the~~ ^{the}
shall be ~~the~~ ^{the} ~~the~~ ^{the}
I suggest that you

make the amount
of iron on the hammer
adjusted but is
to provide a few thin
washers which may be
taken off as desired.
There are some of the
oil chambers made the
long. I believe that
the longer lengths the
shall be better with
no other modification.
I suggest that you

the opening $\frac{1}{16}$ " should be
turned towards the primer.
Copper cord on back.



except on the day
before Christmas. The

Anderson is all right.

The situation shows

the same situation as some

as shown in the

in all parts of the

as the situation is

previous to this.

You will see change

the situation is

nothing else

I would say

and I

are having one of
the best babies made

The Waldorf-Astoria
New York.

You are right it is
perhaps a wonderful
thing that people are
today the power of
the mind is so great
that it is almost
impossible to keep them
from knowing.

P.S. Sunday

I am writing in pencil following
theory of my friend Crocker who holds that it takes less energy.

Nov. 18, 1903,

Mr. Schuff,

I sent message by
telephone today to
have charging coil with
one size thicker.

Please tell Alfred to
look very carefully as
many things are possible

no paper between layers
that is taken on energy.

should be
turned towards the primary

I kept on the paper
 before I left the hall. The
 audience is all right.
 The instrument should
 be put together as soon
 as possible. I have
 in all parts of the
 instrument. I have
 for the same.

You are not charged
 the platinum certificate
 necessary only
 23

[illegible]

make them unwieldy
of iron on the hammer
a dyestub
to provide a few thin
rods which may be
taken off as desired.

Please send Source of the
 Taylor's ~~at~~ ^{at} ~~columns~~ ^{columns} under the
~~Long~~ ^{Long} ~~of~~ ^{of} ~~believe~~ ^{believe} ~~the~~ ^{the}

I believe that
 these changes in
 the machine will
 make it more

2. ~~1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 84~~

...spending 7/6 should be
turned towards the primary
copper and on back. The



Mr. Leo Scherff

Tesla Books

Wardencliff

L. 2

The

2nd ed.

For a copy consult
the card catalogue as that will

The Waldorf-Astoria

that by any connection
with Warden Lyffe is disre-
spectful. I did not mean
to say this before.

You know well Mr. Brewster
that the following persons
remained with me here
for some time. The names are

Mr. J. J. Lyffe, Mr. J. J. Lyffe,
and I believe Mr. J. J. Lyffe.

Mr. J. J. Lyffe is a very
kind and friendly person.

He would suggest that we should
have some more people. I do not
think the others will want
that. If I would have known
that they would feel that way

I would have not made the se-
lection. I made it. It is very diffi-
cult to find a person who
may be of service to the
Waldorf-Astoria.

The Waldorf-Astoria
New York.
Dec. 9, 1903.

Mr. Scherff,

I have come to an
understanding in regard to
the matter of my ma-

chine with that man.

Consider me
a very excellent party. It

is a large number of
from the Waldorf-Astoria, I have

heard of him before.

I would have not made the same
choice I made. It is very different
now.

The Waldorf-Astoria
New York.

Dec. 9, 1903.

Mr. Schuyler

I have come to an
understanding in regard to
the manufacture of my ma-
chines with that man.

De Witt's company is
a very excellent party. He
is a large manufacturer
from California, I have
known of him before.

the primary
and on back.

But in any connection
with handwriting is this
debated. I did not see
him before.

You can tell H. Drunk
that the primary service
studied and he
imposed. The average
is fairly good. I
am 2 years old
to each in the
the handwriting is common. I
could suggest that we learn very
high in some ways. I do not
think the others will have
that. If I could have known from
them they would feel that my
hand



as of a man of great ~~the~~ result but disappointed
energy. ~~He is~~ ~~not~~ ~~making~~ ~~but~~ ~~that~~ ~~things~~ ~~are~~ ~~not~~
all the ~~best~~ ~~parts~~ ~~and~~ ~~moving~~ ~~faster~~. Then
I propose to use the plan are certainly dreadful
down there ~~has~~ ~~done~~ ~~all~~ ~~times~~. One conclusion
the electrical work. It is the ~~the~~ ~~Edison~~ ~~and~~
you see in this way ~~in~~ ~~regard~~ ~~to~~ ~~the~~ ~~contribution~~
small capital ~~and~~ ~~the~~ ~~results~~ ~~have~~ ~~been~~ ~~the~~ ~~so~~
far. He is ready ~~to~~ ~~handle~~ ~~trouble~~ ~~are~~ ~~in~~
take up the matter at a worse fix.
once. As soon as I should be ~~changed~~ ~~by~~ ~~all~~
can manage I shall ~~be~~ ~~as~~ ~~I~~ ~~have~~ ~~discon-~~
to his factory where we were that I have ~~to~~
shall discuss some details. I am ~~for~~ ~~Mr.~~ ~~Ward's~~
I am very pleased with ~~my~~ ~~deeds~~. Everything

72

as a man of great
energy. I have been by me
all the ~~most~~ parts and
I propose to see the plan
down there by the all
the ~~entire~~ work. It
you see in this way a
small capital ~~with~~ reach
far. He is ready to
take up the matter at
once. As soon as
can manage I shall
be in ~~seeing~~ where
that ~~dis~~ some details.
I am very ~~pleased~~ with

but the result has disappointed
the fact that things are not
moving faster. There
are exciting developments
in times. One conclusion
is that the situation in
Japan - the situation
in the Pacific is
not so much as
it was. The
war is
a worse fix.

The name of the place
should be changed to all
means. I have been
told that I have been
suffering from M. Wadsworth's
misdeeds. Everything

He is with
me

Mr. Leo Scherff
Tesla Works
Wardenclyffe
L.I.

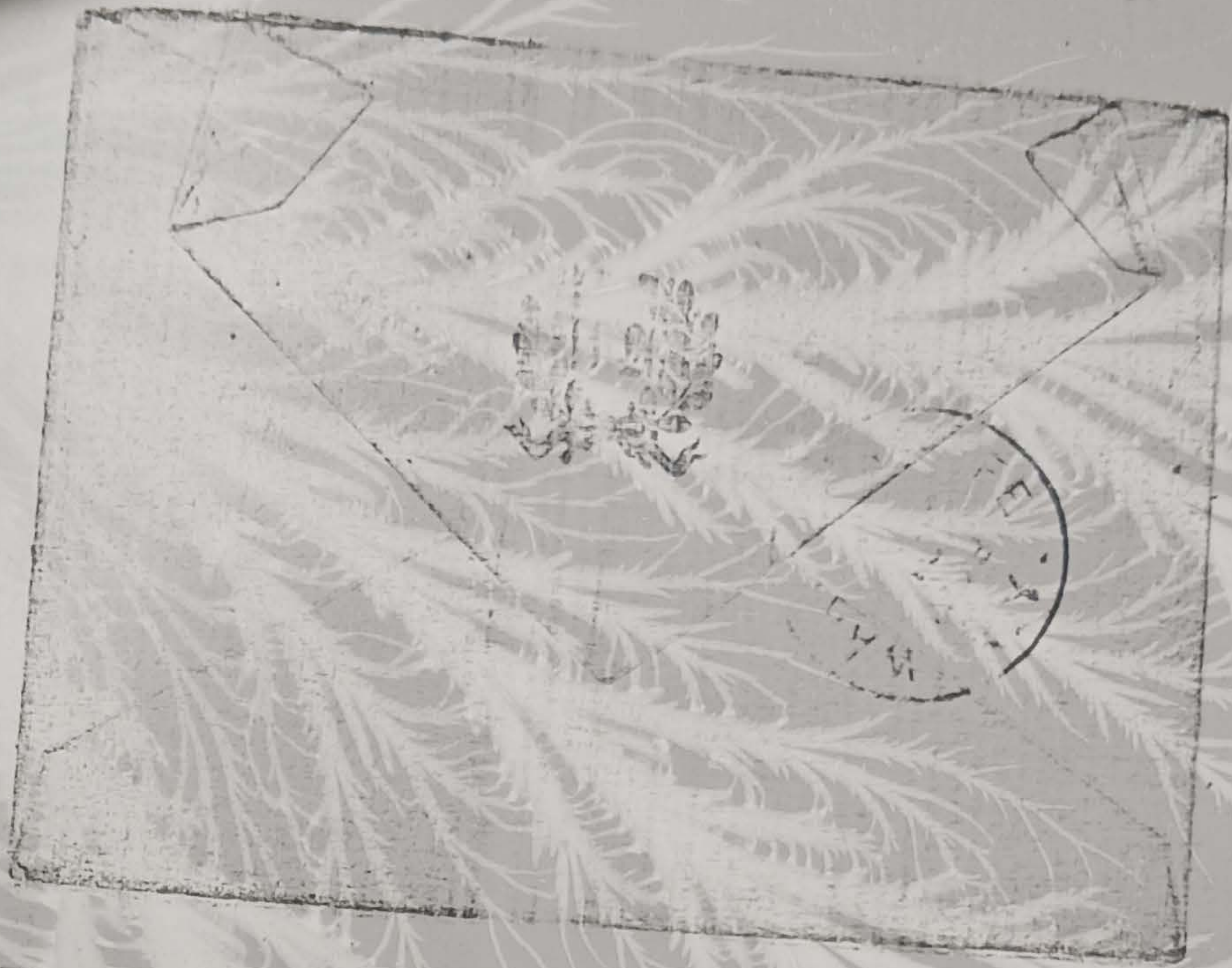
NEW YORK N.Y.
DEC 9 1903
8:00 PM



There has been a great deal of
discussion with Wardenclyffe in this
country. I did not see
you here before.
You can tell Mr. Brewster
about the present position.
(The situation here is
very important. The money
is in jeopardy. I am
afraid of some of the
people who are in my
confidence is anxious to
know what support he can
get in some way. I do not
think the others will have
the heart. If I could have known
I am sure they would feel that way.

I would have not made the same
mistake I made. It is very difficult
to find a place for him now.
The Waldorf-Astoria
New York.
Dec. 9, 1903.

Dear Mr. Scherff,
I have come to an
understanding in regard to
the manufacture of my ma-
chines with that firm.
I have considered a
very excellent party. It
is a large manufacturing
firm. Consequently, I have
heard of him before.



as of a man of great energy. ~~He has~~ ^{He has} made
all the ~~most~~ ^{most} parts and moving faster. These
I propose to ~~see~~ ^{see} the place are certainly dreadful
down there. ~~He has~~ ^{He has} all
the electrical work. ~~He~~ ^{He} is the Edison
you see in this way. ~~He~~ ^{He} is a ~~man~~ ^{man} of
small capital ~~and~~ ^{and} ~~has~~ ^{has} ~~been~~ ^{been} ~~in~~ ⁱⁿ ~~the~~ ^{the} ~~business~~ ^{business}
for. He is really ~~in~~ ⁱⁿ ~~the~~ ^{the} ~~business~~ ^{business} ~~and~~ ^{and} ~~is~~ ^{is} ~~in~~ ⁱⁿ ~~the~~ ^{the} ~~business~~ ^{business}
take up the matter at a worse fix.
and. As soon as I The name of that place
can manage I shall soon should be changed by all
to his factory where we are as I have dis-
shall discuss some details. ~~He~~ ^{He} is ~~in~~ ⁱⁿ ~~the~~ ^{the} ~~business~~ ^{business}
I am very pleased with suffer from M. Warder's
misdeeds. Everything

Dec. 24. 1904.

Dear Mr. Schuff,

Please have Dr. Schuff make

2 small pieces of copper with

handles as a substitute. The dimensions

are only approximate. It makes no

difference if they are more or less.

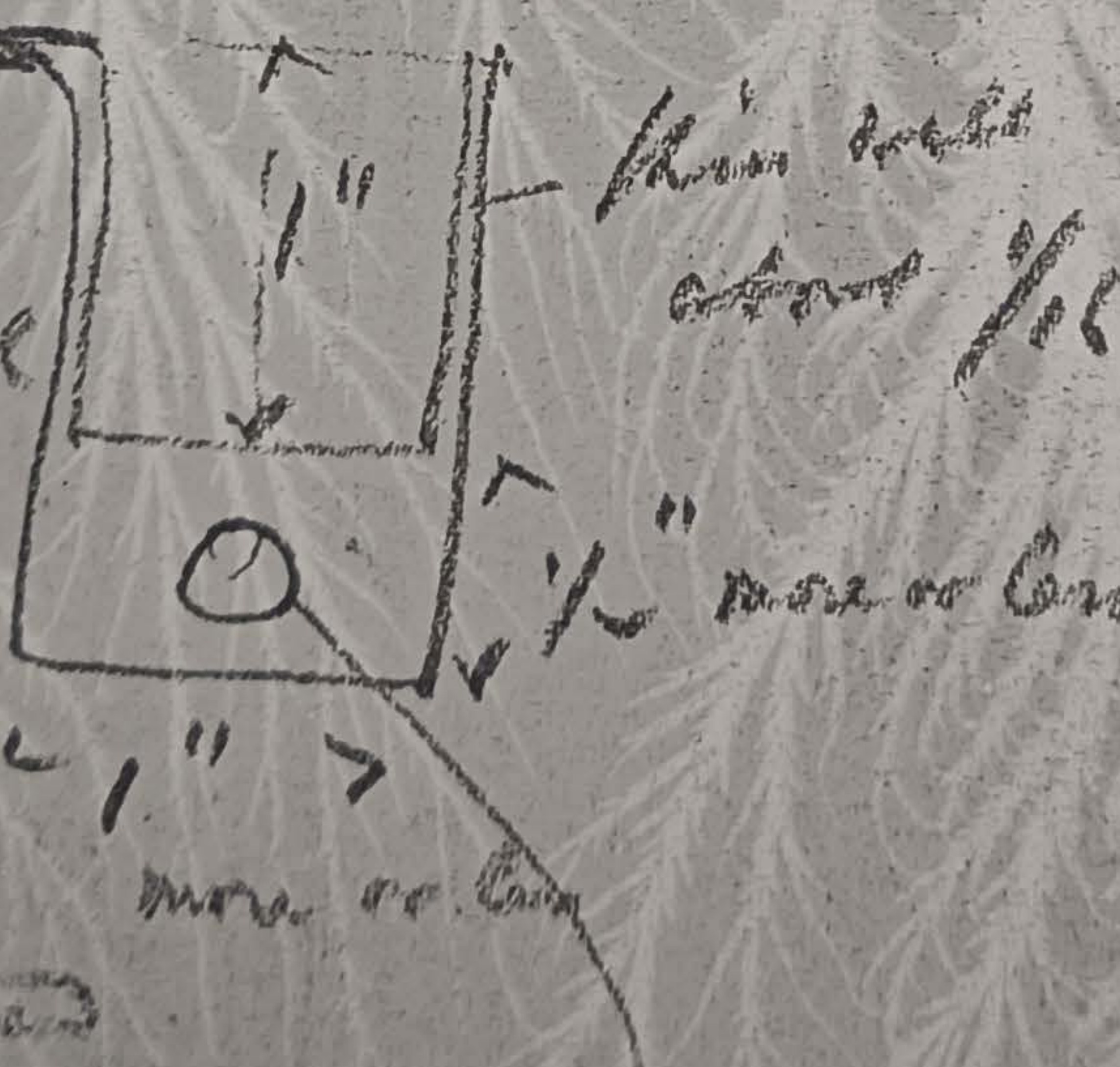
The blocks must have heavy bottoms &

be kept from being bent. They are to be

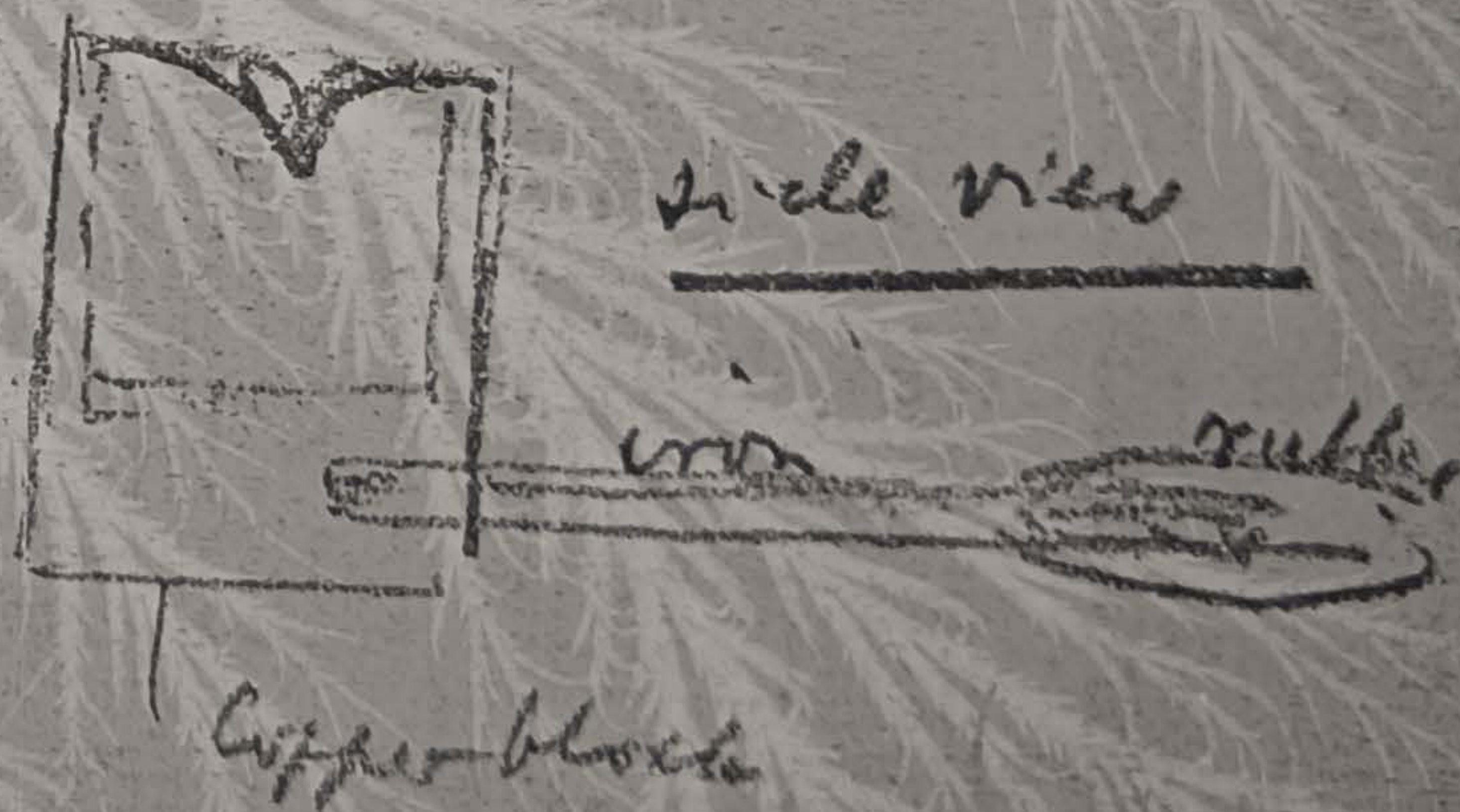
used for pressing sheet metal

against the bottom.

This work
will proceed
out in the
shape of
that the
work will
be well guided
when pressing
out.



1" thick
1" wide
1" high
1" hole for
iron handle



2 of these

over

1

Jan. 24. 1904.

Dear Mr. Schuff,

Please have Dr. Johnson make

2 small pieces of copper with

handles as a whistle. The dimensions

are only approximate. It makes no

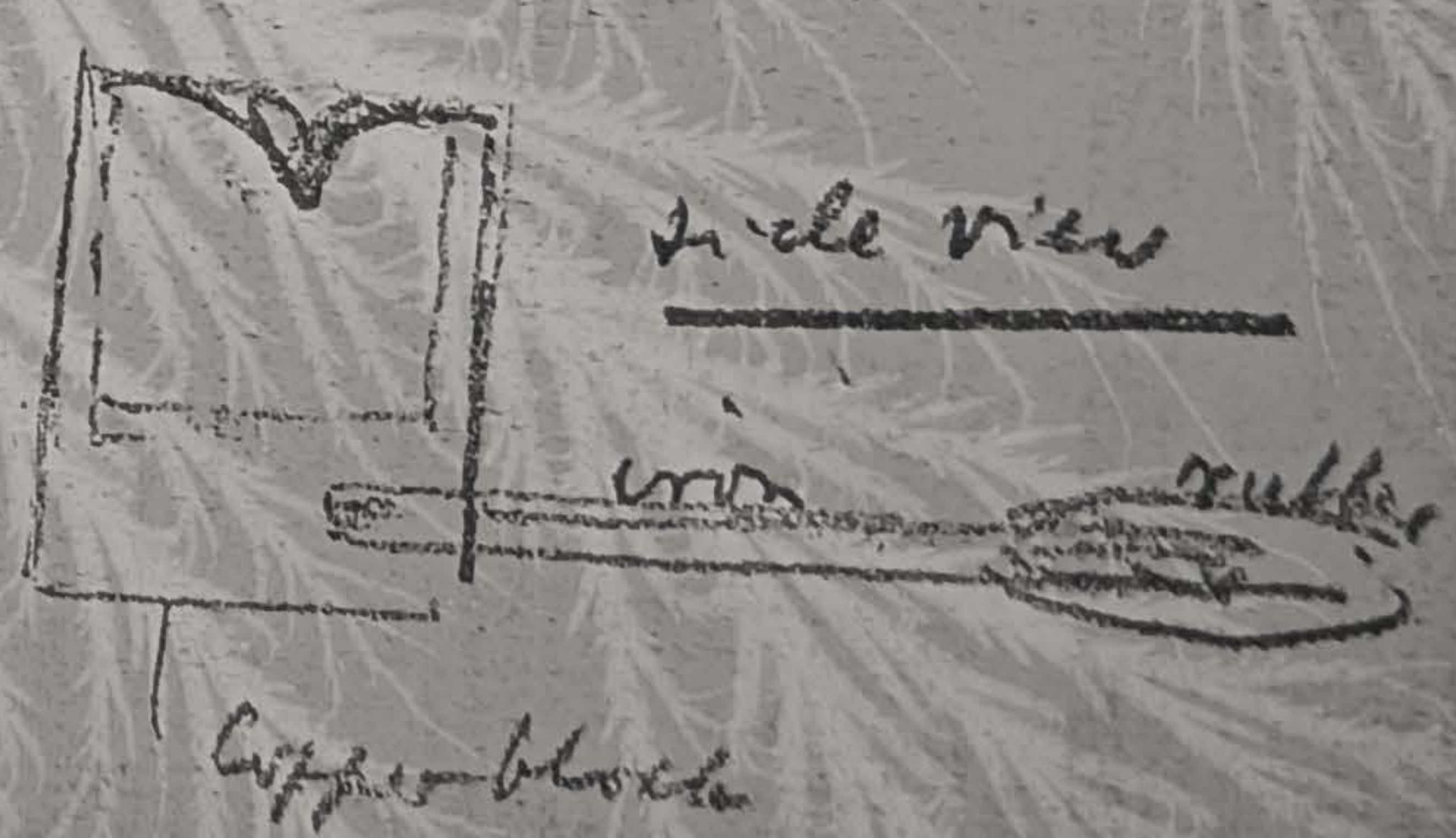
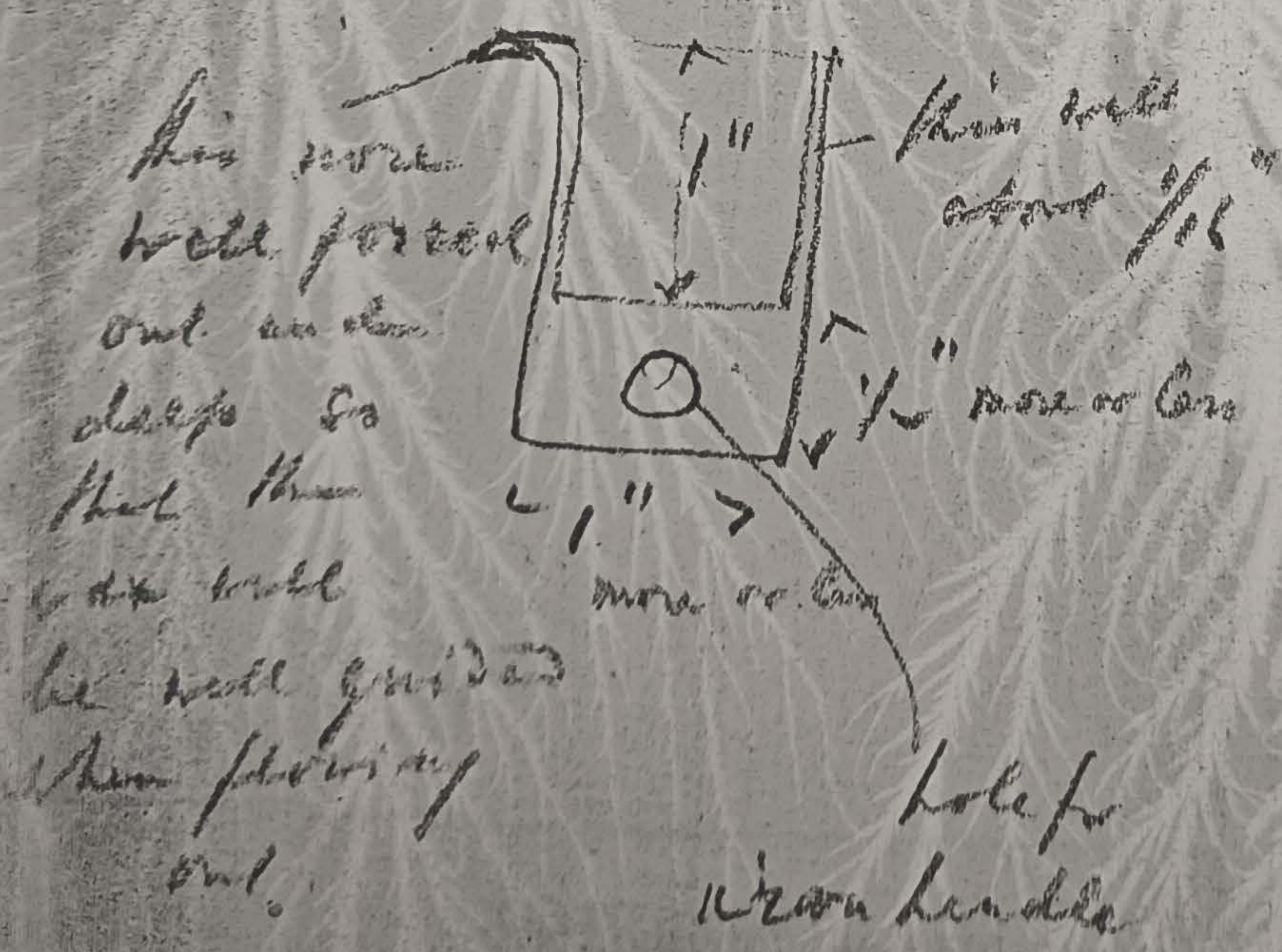
difference if they are more or less.

The blocks should have heavy bottoms &

keep them long. They can be

used for blowing out the

sealing the bottles.



2 of these

over

Perhaps Aunt ~~and~~ I ~~arrived~~ ~~arrived~~
found them ~~at~~ ~~at~~ Monday evening
away ~~with~~ I ~~got~~ them
Tuesday.

I hope you are happy the
ships are there ~~in~~ ~~in~~
Crested ~~in~~ ~~in~~ everything

~~for~~ ~~for~~

~~Love~~

A. T. T.

P.S.

My letters can be sent out
on Friday forenoon

The Waldorf-Astoria
Fifth Avenue 33^d and 34th Street
and Astor Court,
New York.

Mr. Leo

Perle Works

Wardenship

as proposed will be a
perfect success and you

know that after that
I can draw on the
U.S. Treasury.

I must close out with
a few lines. I have
seen the report on the
order of the committee.

Trued to get
you on phone the
whole day in vain. V. Tesla

New York City
June 1, 1904

My dear Mr. Scherff,

This freight is out -
vagrants. I believe the
D. R. R. is pulling
but a band of out-
throats. That there is
no way out of it except
to pay.

Yours at Lawrence

New York City
June 11, 1904

My dear Mr. Scherff,

This freight is out-
raged. I believe the
N. Y. R. R. is putting
out a band of out-
throats. The New is
no way out of it except
to pay.
Please let Johnson

a prompt will be a
perfect success and you

Know that after that
I can draw on the
U. S. Treasury.

I have come out with
a plan to have
the bank and the
order, which is

Tracy
Tried to get
you on phone the
whole day in vain. V. Teale

complete his job as I am joyful Robin
from as possible. Also to cut down the grass
See that all the apple-trees within fence.
returning to the It will look much better.
large ground and is a I found an excellent
good order. I shall try to get with some success
it when I come out the other evening. It was
hard when I began and really remarkable. Had
in the day after to - it changed to improve still
more. For to-morrow but the success was not
I have a number of birds as expected. I am
lost nuts to crack. but saw that the lamp

a proposed will be a
perfect success and you

know that after that
I can draw on the
U. S. Treasury.

I am going out with
a fine lot of
see how you will
order.

Trived to get
you on phone the
whole day in vain. V. Tell

New York City
June 1, 1904

My dear Mr. Scherff,

This freight is out -
ragons. I believe the
L. J. R. R. is pulling
but a band of out -
broads. That there is
no way out of it except

to pay.
Plain let Johnson

B

Aug. 7. 1904.

Dear Mr. Scherff,

I had a dreadful
experience in the college
last night and did
not sleep at all P. A. M.

Mrs. Scherff would very
much oblige me if
she would kindly send
me some coffee
and perhaps two eggs.

Very sorry to trouble you
Sincerely
A. T. T.

Aug. 7. 1904.

B

Dear Mr. Scherff,

I had a dreadful
experience in the college
in the bed bugs and had
to get out at 8 A.M.

Mrs. Scherff would very
much oblige me if
she would kindly send
me some coffee
and perhaps two eggs.

Very sorry to trouble you
Sincerely
H. Terrell

The Waldorf-Astoria
New York.

Jan. 23, 1905.

My dear Mr. Scherff,

Your letter, from
sufficiently to permit
any individual person
to read the terrible
secret of
Waldenlyffe - which
I am too late to

Get the things at the W. Ch.
to-day. The H. & Co. better way
the ~~same~~ ^{you} ~~are~~ ^{are} ~~hope~~ ^{are} ~~the~~ ^{are} ~~the~~ ^{are} ~~abstacles~~ ^{are} ~~a~~ ^{are} ~~my~~ ^{are} ~~regular~~ ^{are} ~~as~~ ^{are} ~~soon~~ ^{are}
I am working hard as I chop off a
on the ~~new~~ ^{new} ~~ones~~ ^{ones}
receiving the support. Lead how new ones
of laying a solid grow. By often
your deliverance. ~~some~~ ^{some} ~~results~~ ^{results}
I build further. Dances of
O.S. Olsen at the house of
supine as lived. N. York

The Waldorf-Astoria
New York.

Jan. 23, 1907.

My dear Mr. Scherff,

Thank you for your

letter of the 17th inst.

and for the information

that you have received

from the hotel

regarding the matter

of the late

Get the things
to-day. I shall be
home soon. I am
now on my way to
the 4 P.M. train.
I am writing this
on the way. I am
feeling the weight
of lying in bed
for a long time.
I must go now.

P.S. I am at home

the
K. & Co. Miller May 1900
the
factory. The
the
abstain, a
are a regular
hydra. Just as soon
as I drop off a
lead how new ones
grow. By after
the morning I am again
by some results
Dinner
at the house I arrived
at 7 o'clock

people to - know of
I am ready.

The work is progressing fast.
Listings will be ready this week
~~and~~ probably the next will
see us further along. I am
doing all I can as you may
imagine. It is going to

be a fine machine. There
do you best in the meantime to
put all difficulties which
may present themselves

Sincerely et Teils
P.S. There is a possibility that I may
want you here for a day or two. Will
write a day before if necessary.

New York City

March 20, 1900.

Dear Mr. Schuff,

I have just received
your letter referring to
the carbon of coal sold
at Dordrecht.

It does not seem fair
to make me or the Coal-
dealers responsible for the
damage. As you know I



offered to the L. J. R. R. Co
to take this coal if they
would only give me a
little time for payment.
In view of their early
promises I was dumb-
founded to learn that they
were not going to
do as well as that. Just
as soon as they refused
they ought to have shipped
the coal away to avoid
injury to other people.

If they have not done
it, it is a very serious
mistake. I am alto-
gether too unfortunate as
have so many troubles to
contend with that I
am unable to suggest
anything. It would be
wiser however to make
any suggestion. Even if
they would let me have
this coal it would be
too dear for me.
I shall see the other

New York City

B March 20, 1900.

Dear Mr. Scherff,

I have just received
your letter referring to
the contract of work
at Dordrecht.

It does not seem fair
to make me or the Gel-
ders responsible for the
damage. As you know I

people to-morrow
I am ready.

The work is progressing fast.
Cuttings will be ready this week
and probably the next will
see us further along. I am
doing all I can as you may
imagine.

It is going to be
be a fine machine. There
do you but in the meanwhile
that all difficulties shall
never present themselves

Sincerely et Telle

P.S. There is a possibility that I may
want you here for a day or two. Will
write a day before if necessary.

offered to the L. J. R. R. C.
to take this coal if they
would only give me a
little time for payment.
In view of their early
promises I was dumb -
founder to learn that they
were lying even
to me but as that I just
as soon as they refused
they ought to have shipped
the coal away to avoid
injury to other people.

26

I My love has done
it is a singular crime -
not neglect.) an altho-
gether to unfortunates as
have so many troubles
understand that I
am unable to suggest
anything. It would be
wiser however to make
my suggestion. Even if
My love tell me how
this card it would be
be dear for me,
I shall see the other

NEW YORK CABLE ADDRESS: WALDORF, NEW YORK
PHILADELPHIA CABLE ADDRESS: RD. OT, PHILADELPHIA



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York March 22 1904

Dear Mr. Scherff,

I have just received a letter from
Clark which has put all the hard-
work I have done to-day, then
I was very tired and have
been exhausted. The more he is an
expert for, but if he knows how
much from the money he would
not like to write. Please send
him the money - all I have -
and let him know I am on

THE
HOTEL
THE
BOLITT

2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841.

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS, "BOLDT, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BOLLETT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York March 24 1905

Dear Dr. Schuyler,

Your letter with the enclosed received.
I do not think it will be possible to use
the article as you wish right. This
is not your fault.

The comment in the El. paper is very good but
I have a better one in German. Evidently
a change for the better in literary place. The
question now is only to get over the trans-
lating difficulties.

Have followed your suggestion and have ordered
a card from Remond Bros. but, of course,
I did not see any way of asking them to
prepay freight. I have requested Ambrise
but he has no other way and they can
ship it one week later.

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PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York March 28 1905

Dear Mr. Scherff,

Firm of all - Saxe's Thunder struck the
Waldorf early this morning. It came
out of a clear sky. Technically, of
course, you know Saxe is wrong. He
ought to be the his lieutenants and then
these should sue me for arrears. But
it is good that he has on this
occasion unfurled his true colors.
I intend to tell him that if my people
should abandon his houses the property
would be worthless for no one else
could be found. This looks like a
good argument or rather club.



Of all obligations I would like best
to get this one out of the way and
I am thinking of securing some sort
of proposition. Should you get some
good ideas please write me.

Although I have not with some draw-
ings - but certainly they can be found -
I expect the machine to be ready
and in operation next week. Clerk should
order the Exhaust as understood last
of Sunday. He can buy his steam and
then a 1/2 pressure connection above the flow,
and put the put the plates in place.
I will arrange all in the machine room
and rest of things as readily as possible. Have
all the men you can get at this. Power
might be used to improve things outside.
You will get the coal very soon. I had a
conversation with the people over the phone.
Your letter was ok. except the understanding
but - der Zweck des Licht des Mittel! "
Some particulars for printing will follow later - will
send you probably with some mail.
Do not forget translation of Pet. Specimen, Smiles & Tsch

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BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEORGE C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York March 29 1905

Dear Mr. Scherff

I enclose right to be perfectly
satisfied for the 1st of the
piping ready for connection. All
pipes should have their valves and union
joints in line. It is also that the
wheel of the steam pipe 5 (2nd steel) is turned
downwards and that the compressed air
pipe is up for convenience of handling.
Please have the valves checked
to make sure that they are set up
tight in order as soon as possible.

NEW YORK
MAR 29
2-30P
1905
N.Y.



Mr. George Scherff

Wardensville



Also call [unclear] he is very
[unclear] helps [unclear] in
fixing up things [unclear] every-
body (except [unclear]) [unclear]
that we have [unclear] a [unclear]
development and [unclear] the [unclear] will
all his energy to [unclear].

Hope you [unclear] [unclear] I
[unclear] [unclear] [unclear] but
[unclear] [unclear] [unclear] [unclear]
[unclear] I am [unclear] looking [unclear]
[unclear] the [unclear] the [unclear]
[unclear] [unclear] [unclear]

Please let me know anything

Travis

As to [unclear] we need:

Vacuum [unclear] [unclear]
Steam [unclear] [unclear] 160 or 180
Air pressure [unclear] [unclear]

This will
direct on
[unclear]
I think we have
[unclear] [unclear]



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CEO. G. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
 and Astor Court.



THE ASTORIA

New York March 29 1905

Dear Mr. Scherff

I understood right from the perfectly
 experienced from the fact that the
 piping leading from the connection, all
 pipes should have these valves and
 joints in line. It is true that the
 wheel of the steam pipe (2nd wheel) is turned
 downwards and that the compressed air
 pipe is upwards for the purpose of leading
 pressure down and that is what
 he wants so that I may find out
 that it is not as simple as it seems.

Also call Frank he is very
 helpful in
 fixing up things in the
 body (except holding) that we need
 that we have not an improvement
 development and the work will
 all be away and abating.
 Hope

for any development but
 we are not working on it
 regularly I am not working on it
 as working on it now in the last of the year
 for the year and the year and the year

Please let me know anything

Summary Test

in 6 groups we need:
 1. Pressure and temperature
 2. Pressure and temperature
 3. Pressure and temperature
 4. Pressure and temperature
 5. Pressure and temperature
 6. Pressure and temperature

This will be
 detail on
 reading
 I think we have
 plenty now.

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THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.
GEO. C. BOLDT, PROP.

THE ASTORIA

New York March 27 1907

Mr. J. S. [unclear]

I have been in a state of
 mind since 11.30 P.M. when I
 have been placed in
 a hospital. I have been
 in a state of mind since
 11.30 P.M. when I have
 been placed in a hospital.
 I have been in a state of
 mind since 11.30 P.M. when
 I have been placed in a
 hospital. I have been in a
 state of mind since 11.30
 P.M. when I have been
 placed in a hospital. I have
 been in a state of mind since
 11.30 P.M. when I have
 been placed in a hospital.

from the top of the ...
... 2 ...
... 2 ...

... of the ...
... 1/2 ...
... 1/2 ...

... will have their
... along
...
... the pipe

... will be $2\frac{7}{8}$ "
... center -
... above the pipe 2

The ... is ...
... just the right ...
... The
... will be ...
... in ...

...
... Test.



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GEO. C. BOLDY, PROP.

THE ASTORIA

New York March 29 1901

2000

I have been thinking about you
and how much I love you. I am
so glad to hear from you and
to know you are well. I hope
you are happy and enjoying life.
I am still here and doing well.
The weather is beautiful here.
I will write again soon.

[The page contains faint, illegible handwriting throughout.]

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and Astor Court



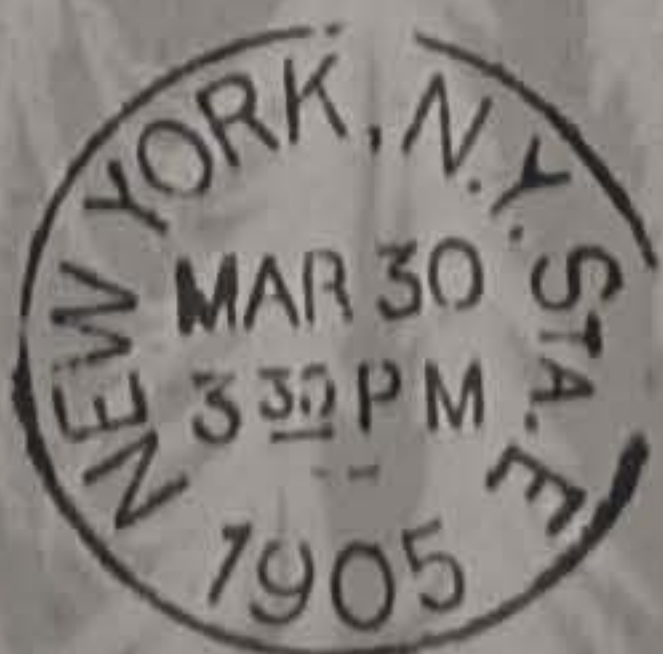
THE ASTORIA

New York March 30, 1905

Dear Dr. Scherff,

I have shown the list of Dr. M. T. Co.
at this date, I am sure it has
been forwarded by the
mail.

Please keep the
copy of the list for re-
vision. The
list will be the work well
done. All will be O. K. as far as the
operation is concerned. I feel sure.
This is a very
important matter and
I will take care to have it done
as soon as possible.



Mr. George Scherff
Wardenslyffe

[Faint, mostly illegible handwritten text, possibly a letter or a list of names and addresses.]

[Faint handwritten text, possibly a signature or a note.]

My dear Mr. [unclear]
I have just received your letter of the 10th inst. and am
glad to hear that you are well. I am
very much interested in your work and
hope to hear from you again soon.

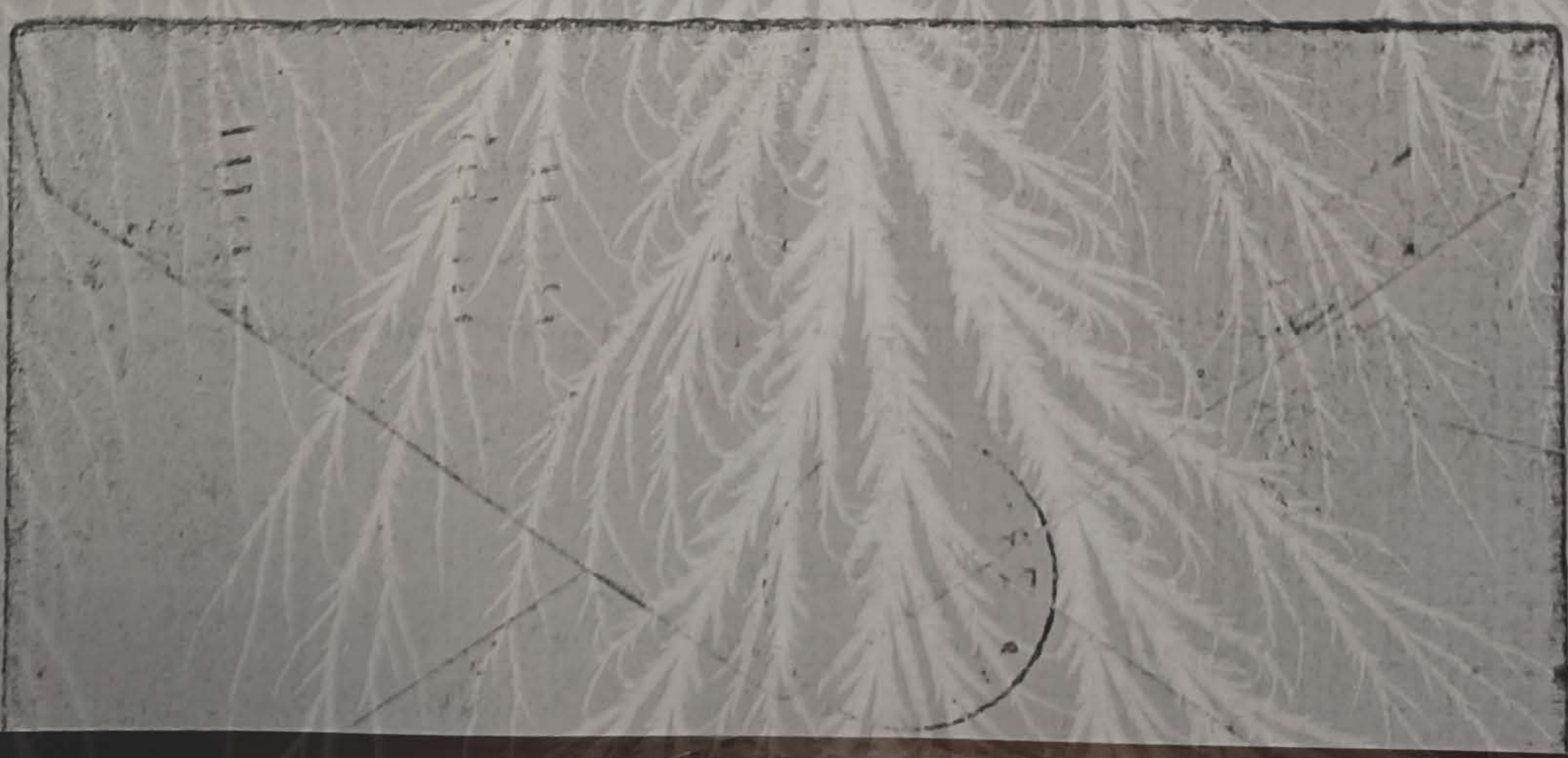
I suppose that the [unclear] [unclear] [unclear]
this work [unclear] [unclear] [unclear] [unclear] [unclear]
appearance, [unclear] [unclear] [unclear] [unclear] [unclear]
as I let you [unclear] [unclear] [unclear] [unclear] [unclear]
written to the [unclear] [unclear] [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]

Yours truly,

W. F. [unclear]

P.S.

Some [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]
in the [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear] [unclear]





THE ASTORIA

25 1905

from
the
and
our
but
for
importance
you
which
in mean



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NEW YORK CABLE ADDRESS
PHILADELPHIA CABLE ADDRESS

The Waldorf-Astoria, Fifth Avenue 110 and 111 Streets and Hotel 111



THE ASTORIA

New York March 30, 1905

Dear Dr. Scherff,

Enclosed please find of Dr. N. T. Co.
at this date, I enclose is that I
am enclosing my job and one billion
dollars.

Please bring the money here for re-
ception of the money and my friends. The
money will be the work well
along. Last night I was eye the camera
lens. All were be O. K. as far as the
operation in connection I feel sure.
This money will be sent out
the rest of the collection.
I will be go to all the banks

NEW YORK, N.Y.
MAR 30 6
3 32 PM
1905



Mr. George Scherff
Wardenclyffe

The Waldorf-Astoria
New York.

April 3, 1905.

Dear Dr. Schmitt,

Your letter has just
reached me.

I know of course
you would have some
getting
Fork and
we
to run

Sincerely

W. D. Schmitt

... together!

To recd the paper and the signs of double
 T. 123 456 789 1011 1213 1415 1617 1819 2021 2223 2425 2627 2829 3031 3233 3435 3637 3839 4041 4243 4445 4647 4849 5051 5253 5455 5657 5859 6061 6263 6465 6667 6869 7071 7273 7475 7677 7879 8081 8283 8485 8687 8889 9091 9293 9495 9697 9899 10000

[illegible]

The double the needed amount - seven or
 more will do right to the hundred

*but I leave
the
advice*

I have used

Do not break
Peter
never
K. Frederick
writing

very much
improved
every day.

The Waldorf-Astoria
New York.

April 3, 1905

Dear Dr. Schenck,

Your letter has just
reached me.

I have a course
you would have some
benefit in getting
all together. For a day
we have time to all

Respectfully
Yours

and the higher end
P. i. 12. In summer
has deserted. I have
2. double the number
made into all right
but it seems more
the by art. I have
more than the deer in
do not mind a Peter
He discouraged me
very much when he

... I think signs of doubt
... and seem to believe

... that we play a

... game - game or how

... with the champion

... of the new machine

... I think I have

... made a good use

... for the invention the

... enemy. I am writing

There is a clear

of the same

the boiler (and

note) of H. Heger

about the

the

the

the

the

the

the

the

the

the

wrote them down as through.
I am confident of success
in incorporation, and return
yet from my hands. I believe
they have been written
Thomson.

A lot of difficulties
trouble to dangers but
the last word has been
long. Do not feel
with me as I have
known to stand.

Sincerely

W. T. H.

The Waldorf-Astoria
New York.

April 5, 1905.

Dear Mr. Scherff,

Your letter with German
Patent Office just received.
On the next installment, which
should reach me tomorrow,
I will send down an
introduction according to
the German Patent process.
Also please proceed with the
others. I can assure
you that these particulars
are. I am, Sir, very
truly yours.

last night and put off the revolution down there. The
papers from England, also columns President elect is a Penn-
sylvania man, it is a
radical change.
The Italian Council
made trouble and then
power of attorney will go
out to-morrow. It stands
out as here there
it is not in fact. The
Dinner can be served, points of connecting pipes
for suction and com-
pression. But there is
the tedious work of
fitting
I can not tell how
The

Through

The Waldorf-Astoria
New York.

I have

April 5, 1905.

Dear Mr. Scherff,

Your letter with German

translation just received.

The new trademark, which

stands which we have

with down an

introduction according to

the German Patent pattern.

Also done preceding the

changes. I can as re-

member these particulars

now. I am

last night and put up the
papers from England, also columns
of figures, and from a
Hague. The Helms Council
made trouble and then
power of Attorney was for
my to-morrow. It should
be in time there but
it is not as yet. The
Dinner can come to the
I can't say the Court has
disapproved that the Court has
not shown any and certainly
re-verify the necessity of
the moral spirit of Wednesday
perhaps be in seeing

The Revolution down there. The
President elect is a Penn-
sylvania man, it is a
radical change.

As to the machine —
tomorrow the compressors, valves,
and all the rest, will all be ready.

Steam shaft and some
parts of connecting pipes
for suction and com-
pression.

That there is
still the tedious work of
fitting to fitting.

I can not tell how
long it will take. The

no more

with the same day through
I am anti. Dec 7
in its corporate
you from my hand I have
they have been
Thomas

A lot of anti-
work is being done
the camp was
long to my feet
with the
how the

Sincerely
W. T. Ford

Please by wire
 advance him
 I hope
 to see him
 together!

The Waldorf-Astoria
New York.

April 7, 1905.

Dear Mr. Scherff,

I received your letter
 this morning but was unable
 to send you definite in-
 formation before this moment
 when I wired you that
 some party - base, top, and
 Congressmen etc. etc. will arrive
 will depart 7 o'clock
 train. Charges are prepaid.
 I telegraphed to Reimer Bros

They say car has been shipped. Tomorrow at some time has
should ~~be~~ ^{be} ~~ready~~ ^{be} today. ~~has~~ ^{has} spent on them. The
or to-morrow. It will be apparatus for grinding the
important to get these points but to be arranged
some boiler in time. The for C.I.C.
dealers are sending another. Hartman has promised to
Carload which should arrive ~~some~~ ^{one} when we reach
a few days later. ~~him~~ ^{him} - about Wednesday,
The work on the rest of ~~or perhaps~~ ^{or perhaps} before.
machine is well advanced. Expect to come out
It is possible that we shall Sunday to settle all
have it all together there by relative connections and
Tuesday. I have been dis- running.
appointed at some drawbacks. Have no news as yet
but it could not be helped. for my friends. Suppose
The connections are quite to - they are bedding off!
over, Emery & Tuck

that in view of that it would be ^{unwise} ~~unwise~~ ^{unwise} to delay
the transaction.

that in view of that it would be ^{unwise} ~~unwise~~ ^{unwise} to delay
the transaction.

that in view of that it would be ^{unwise} ~~unwise~~ ^{unwise} to delay
the transaction.

April 12, 1905.

My dear Dr. Schmitt,

Trouble, and trouble, again!
Otherwise I won't have written
before this.

The ...
The ...
over ... the ... of
the T. M. Co. I suppose some
birds better be come up
which seem big to me
just now.

To-morrow the ice has

express the value of some better full his disordered as
pipe connections for the machine. I got your message
This is some brass work please to take that it was not
like some of it. Express not particularly to suggest some-
prepared. Ecco it peccato! thing by telegraph. Remember
we are not taking the groundings that we find the boiler on-
/into it. It is a sharp point with the same affec-
tion. Along the journey. As we are Pipers? Suppose
the people I fear that it is to fill the leakers through
and take the use of this with a hose. Looking can be that
I explode all. The next week off all valves. I told the
ought to bring the promised boilers to-day that the blow off
thermies. The next to replace valves are looking and he
I do not care if he is a Jew. Suggest sending out one of
Your friend in jumping the air gun. That I was afraid.

W
B
hope
accident

Com-
will

MS

April 12, 1905.

My dear Dr. Schaff,

Trouble, and trouble again!

Otherwise - I would have written

before this.

I am of the opinion

that the present state of affairs

over the matter is very favorable of

the T. M. Co. I suppose some

birds will be come up

which seem big to me

just now.

To-morrow they will be

that a view of them at once
is desirable to delay
the transaction.

express the values to some
pipe connections for the machine.
This is sure to be with plain
like some of it. Express not
prepared. Ecco il peccato!
We are now acting the grand
/ with a few more to show
the people. I fear that it
was taken the use of this week
I explore all. The next week
ought to bring the promised
Theories. The next to believe
I do not care if he is a Jew.
Your fierce in pumping the

letter full his disheartened
pretty. I got your message
to take that it was not
possible to suggest some-
thing by telegraph. Remember
that in ~~the~~ the boiler on
the ship will be seen after
being in the ~~Boiler~~ ^{Boiler} ~~Boiler~~ ^{Boiler}
go by to fill the leaks through
a hole. ~~leaking~~ can be shut
off all valves. I had the
boilers to-day that the blow off
valves are leaking and he
suggested sending out one of
his men. That I was afraid

To do that for this purpose
which you know me as least.
You ought to be able to
force the boiler by means of
port and as well, perhaps
a regulated water down the
business.

I believe that a thin rubber
you can use well to a
level of port
do the best you can. The
any rate I want by the boiler
once more with a new
keeping up water constant
water there has been
level of water in the boiler

P.S. Please answer me in a polite way and say that
a new edition has been complete in preparation and

that is what I want
the boiler to be
filled with water
and the boiler to be
filled with water
and the boiler to be
filled with water

Could free himself Friday
to come pick them. He
will need an order /

2 3/8 " (Should be more perfect)

Kindly see this so that he
can find something to prepare.

Timer ~~will be~~ ready ~~for~~ Friday
all around. That means
a big lot of ~~work~~ work
next Sunday. If everything
can be prepared ~~at~~ at
present will be out Sunday.
I think we ought to get it
ready.
Hugs etc for your self just now
Sincerely - Mr. T. L.

The Waldorf-Astoria
New York.

April 19, 1905.

Dear Mr. Schmitt

Finally the company has
come into existence as
you may see from inclo-
sure disposition of N.Y. Con-
ference.
In the Hand of Time
you find much more in
the past than in the present
were after the fact at 12 P.M.

st night, probably is the Song we had a download
new ~~when it was~~ fresh. With the first of sugar.
I refused information and it had no effect over
no mention was made in the papers. I spoiled
those papers. This makes it necessary

My specifications for starting any
were present anything however
thicker brown today. I
am interested in going over
it to see if everything

The Waldorf-Astoria
New York.

April 19. 1905.

Dear Mr. Schuyler

Finally the company has
come into existence as
you may see from inclo-
sure clipping of N.Y. Con-
tributor.

In the Herald of Times
your friend Rind's name is
mentioned. I saw it in
your clipping near 12 P.M.

last night, probably in the
new weather, fresh.

I repeat information and
no mention was made in
those papers.

My specifications for the
were put in and the
the same day.

an interested in doing
if L. can be anything
was for the country.

Some of the
was L. the same day.

for the same day.

likely is the
fresh.
and
made in

for the day
the house
day. I
very over
enough to
all. I
of it
and as I
from the

Long we had a drawback
with the first of the
I had as shifted over
night probably and spoke
later. This makes it necessary
may be cut off a piece
and screw on an extension
clay about one day, very
welcome as you may
require.
I promise for arrangements
to be made from
to-morrow. If Clark

Can't find himself Friday
he can't find them. He
will not be there of

2 3/8 "

(I shall now perhaps
Kindly write him so that he
can find something to prepare. For

Times wrote that Trinidad some
and some that them you
they have a few rooms in
next Sunday. If everything
can be prepared where to
be prepared with in Sunday you
I think we ought to get it
ready.

Thyself for yourself just now

Sincerely

Wm. F. Allen

will be necessary, To
check the price as little
as possible. The rest
of the business is all
right and I would like
the other work to be
sent to me. I am
glad to get the letter
from you about the two
long brass connections.

I got my patent today.
Finances
Robtson.

Finances

Robtson

The Waldorf-Astoria
New York.

April 19. 1900

Mr. Scherff
I was expecting you to
this evening to hear some
thing from you about
the thing in fact.

The two pistons for
compressors will go with
them to-morrow. They are
afternoon. I should reach
the evening. I

at the following court
house on Friday morning
Please note ~~being at the~~
The first to be called
to the upper ~~comptroller~~ ^{error} in
is marked 1. On
the other which goes
to the lower ~~comptroller~~ ^{cylinder}
series to have there
the mark.
Don't forget
to do this work
be sure that he
can not make an
of course
he can not make any
filling
to its
by the
it goes in
region, Bend,
you have the drawing
of the mechanism.
By a small shop

The Waldorf-Astoria
New York.

April 19, 1900

Mr. Scherff

I am expecting you to
this morning to have some
business for you to handle
this afternoon.

The two persons for
comparisons will be with
you tomorrow morning
afternoon. ~~What~~ ~~What~~ ~~What~~
Not necessary to

The following account
has been given by me of

Plasma and its properties

The plasma has been found

in the upper atmosphere

in which it is found

the plasma is found

in the lower atmosphere

in the form of a gas

in the form of a liquid

in the form of a solid

in the form of a plasma

in the form of a gas

I am sure that he
 has not made any
 mistake of course
 he cannot make any
 comparison error in filling
 the
 light
 cylinder
 there
 you have the drawing
 of the machine.
 with
 a
 couple of

will be necessary, To
check down the little
as far as possible. R. and

the other side

will be and the

the other side

the other side

the other side

the other side

the other side

the other side

the other side

the other side

the other side

the other side

the other side

library by Saturday eve-
ning and we ought to
run the machine Sun-
day.

It was indeed great
to see the machine run
uninterrupted - almost
in a continuous stream
of paper. The
attempts to fix it
the place was clean
after a few days
on one of the
telegraph lines.

Ever
yours

W. L. G.

The Waldorf-Astoria
New York.

April 20, 1905

Dear Mr. Schieff

I found your note on
my return home late this
evening.

To have a machine
run at the Waldorf

is a great thing.

We have however the

machine in the

celebrity of the

the spring let the

I believe that I cannot and stay till Sunday
safely dependent on her evening. I am so sorry
for giving us her house if Clerk should come
improving at least should Friday (the morning) and
that foot so further than not be able to come
be her already.

The day is very fine and the weather is very good.

we found it very important to finish the job today. I am disappointed at
what we will be able to do. I have been very busy
probating the case. It is no longer the
little case of yesterday. I am very busy in the

The Waldorf-Astoria
New York.

April 20, 1905

Dear Mr. Schuyler

I found enclosed in
my return home letter this

enclosure

The

to London

There is no doubt

the fact however that

in my letter another

claiming from the

from Spring 1891

I believe that I am
safely dependent on her
for giving us her home if
temporarily at least should
that prove so further than
we are already.

The same is true of the
other side of the mountain.
We found it impossible
to finish the job today. feel
that we will be able
probably to finish on the
other side Saturday.

I went and stayed till Sunday
evening. I went to see
her home in Clark County
least about Friday (Thursday) and
then then was a letter of course
the work. I have been
in the house for some time
and I am disappointed in
the way. I have been
feeling I am a slave.
It is an awful thing
to feel of the same
person and be in the

The Waldorf-Astoria
New York.

New York 1903-
April 20

Mr. Fisher you must
~~give me~~ ~~some~~ ~~money~~
for my interest I will
not stand any longer
if I do not hear from
you to morrow I will
go down to Wadsworth
and look you through
Out I have all
the money I want
no more feeling
Yours S. O. Bay

The Waldorf-Astoria
New York.

New York 1903-
April 20

Mr. Fisher

you must
see ~~me~~ ^{me} ~~see~~ ^{see} ~~me~~ ^{me}
for my interest I will
not ~~stand~~ ^{stand} ~~any~~ ^{any} longer
if I do not hear from
you to morrow I will
go down to Wadsworth
and look you through.

Out I have all
the records I want
no more holding
Yours S O Saxe

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BOLDT, PHILADELPHIA"



THE WALDORF
THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.
GEO. C. BOLDT, PROP.

The Waldorf Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York April 21 1905

Dear Mr. Scherff,

The printers have been expressing this afternoon with 4 o'clock hours. Hartman is supposed to come out tomorrow noon and I am to leave at Wednesday the Sunday. "For Messrs. Scherff's last letter." Have not yet solved the problem that confronts you with the Express Co. is very much disappointed at the delay of your little transaction. This evening probably the valves (especially for the machine will also reach you. This means a new difficulty. The rest of the machine will be ready Saturday and I could either bring it on

THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.



THE BELLEVUE-STRATFORD



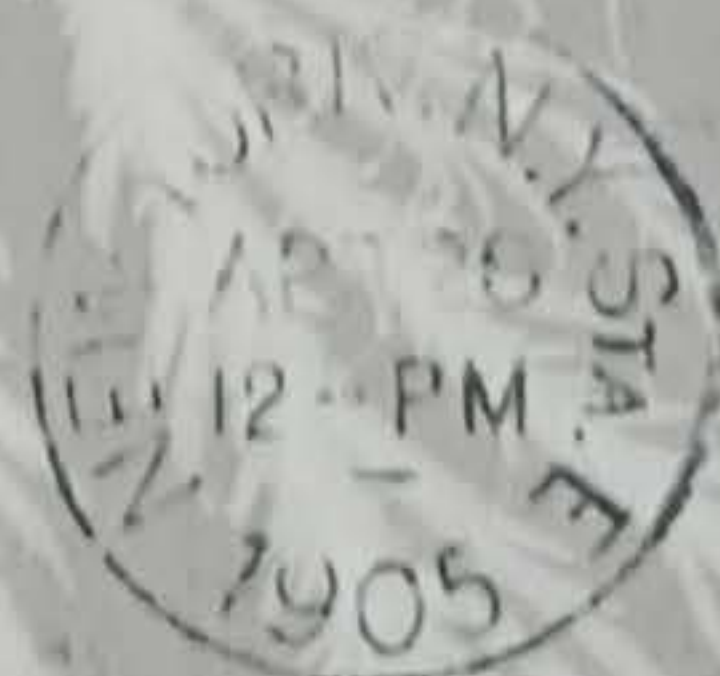
THE ASTORIA

Dear Dr. Scheff,

New York April 26 1905

We have again to meet at the West of
8:30 (my room) tomorrow evening. If
you do not hear from me further in
this matter you will know that we have
you to our advantage. I think you can take the
3 P.M. train as have plenty time to get here
after your dinner. I am Yours truly (of course what
have been Yours truly to reach you
coming Yours truly

It is possible that you have
 been out some time of course, possibly



Mr. George Scherff

Hardenbyffe

the two arguments concerning (carriage legs and lines).
I have found a good solution of the difficulty
causing of repeating the curtains and work
have suggested the which together with
shall have the fair good accident shall
on the side which is damaged. Please
send your reply. I am sure that the
above will be of perfect success.
Do not forget your explanation from
Hampshire. Also the particular
forms sent away at the meetings.
About I saw the argument concerning I will
let you know of it before you have
by telegraph. It would be well to push
them up. As I come to think up it we
might also want the money (all 8).
I have been carrying out of water every
evening. From the fact that at the tanks
the water is well back. Try
to get all tanks full. Encourage the fellows
as I am confident they will go better soon. Found
lots of swimmers in the river! Leaving at 7 o'clock



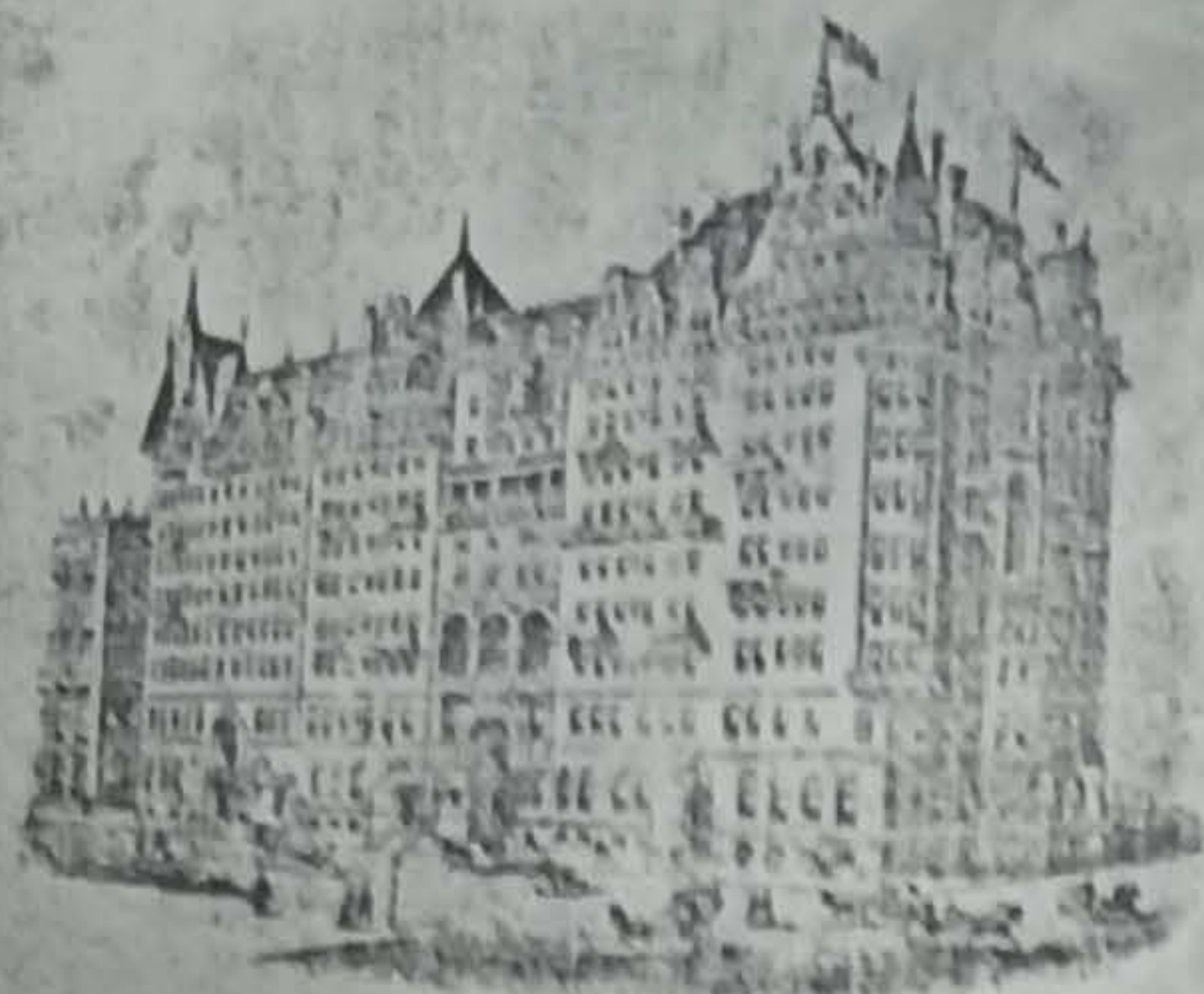
the two Congresses (Congress by and large).

I have found a good solution of the difficulty
of regulating the currency and will
have no doubt the two things together will
show that the fear of a scandalous
case in the future which has tempted them
last year only. I am sure that the
other side will have perfect success.

Do not forget your explanation from
the following table of particular
forms and say what you mean.

About I think the Congress is
led by the House of Representatives
by telegraph. It would be well to put
them up. As I think of it we
might also have the following (all of).

I have been very busy of votes every
evening. The House has the roads
and the votes are well taken. Try
to get all votes first. Encourage the fellows
as I am confident things will be better soon. Found
a number of troubles in my room! Truly
yours



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

Dear Mr. Scherff, New York April 28 1905

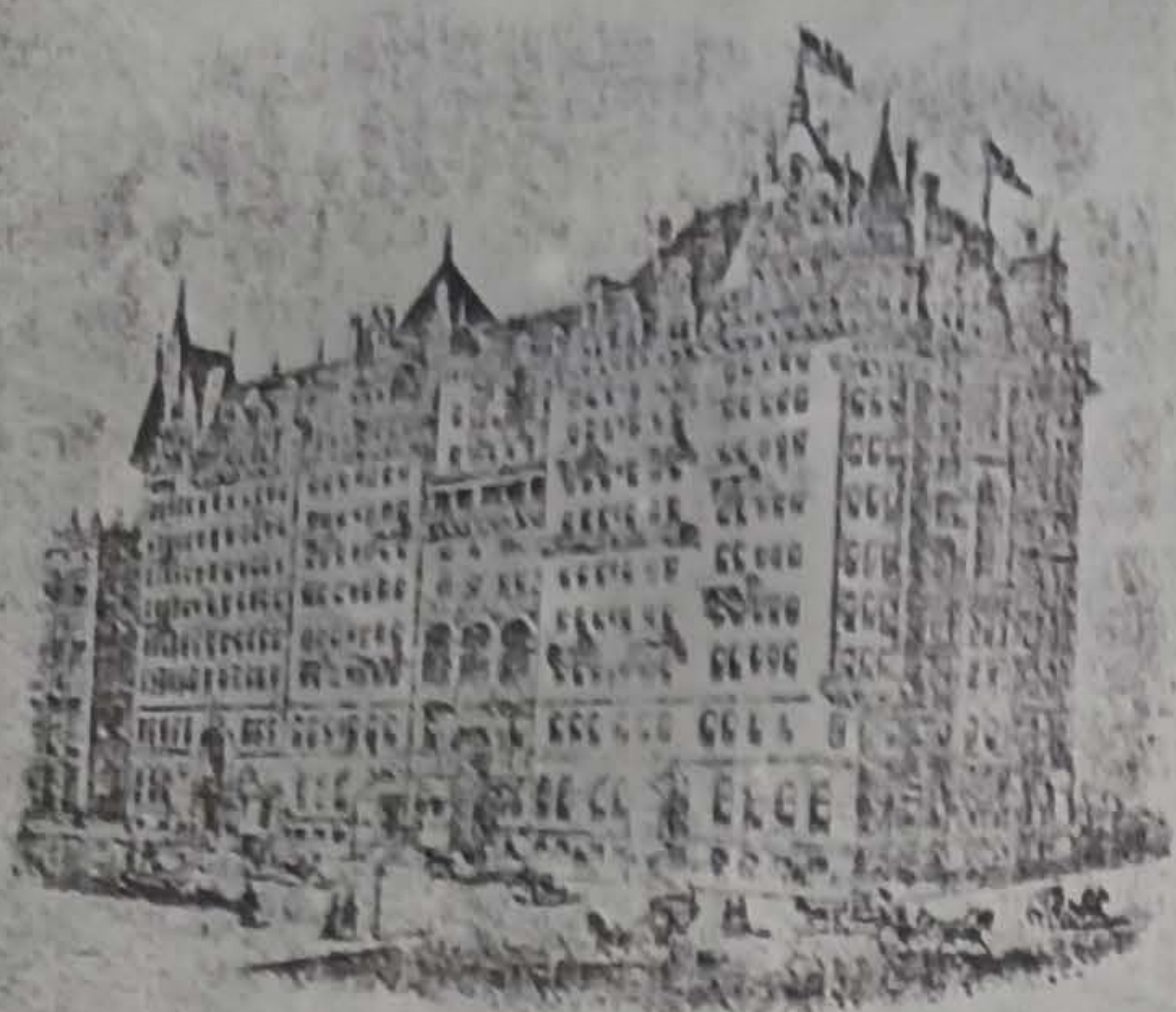
I was awfully disappointed to receive
your letter yesterday that of course of
course that does not apply to the
cheer which we have.

This evening I have dispatched the
brokers (your money) and they will
reach you with 11.00. I have
been already wired the afternoon. Your
letter was delivered to me at 11. P.M.
and I am hastening to catch the mail
and tell you that I shall again

Mr. George Scherff
Warden of the

erh Hartman to come and the have
in the afternoon and to there at 7 P.M.
It would be well to have steam in the
evening. However, if Clark can come
either Saturday (6-morning) evening or very early
Sunday he might be able to turn out
the cylinders and fit the two sleeves in
them by Sunday afternoon, for there
is not much work in getting at
this kind of machinery. Suppose you try
to communicate with him on receipt of this
and ask him to come Saturday evening?
He could fix the cylinders, boiler and Sunday
he might be far enough that we could
leave the machinery. If possible if he comes
out on the 10-40 train there will be
some little time. I can not see how I
can bring out a stranger but I say find one
to move. Write telegraph to this effect, which
which you can communicate with Clark and have
some steam in the evening.
Do not mind gauges and wood flanges Francis & Tark
The boring of the cylinders and fitting of bushings is the important work.
P.S. Charges on bushings are prepaid, Has the repaired piece arrived?

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PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

Dear Mr. Schaff,

New York April 28 1905

I was ~~amazingly~~ disappointed to receive
your letter ~~stating~~ that up, Clark, of
course that has not apply to the
chee sheet is to come.

This evening I have dispatched the
bookings (given a notice) and they will
reach you with 11 hours and I
have already written the explanation. You
letter is delivered to me at 11 P.M.
and I am hastening to catch the mail
and tell you that I shall again

ask Hartman to come over the house
in the afternoon and be there at 7 P.M.
It would be well to have steam in the
evening. However, if Clark could come
either Saturday (to-morrow) evening or very early
Sunday he might be able to turn out
the cylinders and let the two pistons in
them by Sunday afternoon, for there
is not much work and he is good at
this kind of mechanism. Suggesting you try
to come in touch with him or write of it
at once. He is coming Saturday morning?
He would be in the workshop, but on Sunday
he might be far away. But we could
let the mechanic, who is coming, if he comes
out on the 11-40 have the pistons in
the cylinders. I can not see how I
can bring out a cylinder but I may find one
to-morrow. Write telegraph to this effect, unless
when you can communicate with Clark and have
some steam in the evening.
Do not mind gaskets and wood flanges Francis is there
The boring of the cylinders and fitting of bushings is the important work.
P. S. Chaper on bushings are prepared, has the repaired piece arrived?

lves
and
Z.

John
H. H. H.

Have ordered the low
of first quality paper \$37.⁰⁰
Key stock in business 6%.

about 500 lbs per
acre. They are about

The ground cultivated
so far (1/2 of whole
included in pasture. The
cattle seem to be

The largest (American
Agriculture Company
(Co) and they seem
to know the amount

large Island. They pro-
posed to send of one

You will see 100 some
new. better which I

I have
 been
 about
 weeks
 and

intend to use the pre-
 pared my sensitive device,
 please do not use the
 one just carried away.

The ~~more~~ people are
the more they call.

17. ~~100~~ 100 ~~100~~ 100
 200 100 100 100
 100 100 100 100
 100 100 100 100

I have expressed & have
 been placing the
 small machine before
 you. I think
 it is just

Spencer will observe
of the new light machine
and somewhat larger than
his is in all work
here.

As you have done
with the machine
last day.

Love

The Teacher

7
from
have
again
My
And
the
the
of
very

The Waldorf-Astoria
New York.

Apr. 29. 1906.

Dear Mr. Schuff

The Pease Co. has
stopped all except
the small copper-
fens. They tell me
that the large copper-
fens are rather weak
but I think they will
do as we never need
to handle them except
when empty.
Love yours I forget

to tell you to make

up another copy of the

two separate sheets

we shall have with

them

I am awaiting to

come out the copy

to print the

copy to the

authorities (3 papers) and

the papers

are

being

to be

but I forgot that it was

which I had when it is sent

which will I will send things we need yes.

I thinking to be plan
the more convenient)
the plan
behind the by engine
the last connection
to be unnecessary in not
difficult as you said
the large paper
as above and to
different styles and then

Very

can under the following
I we should be glad
for with the following
the following

Running

✓ Tuck

Be
The
stop
the
length
that
length
but
do
to
when
from

The Waldorf-Astoria
New York.

May 1, 1905.

My dear Mr. Schuyler,

I enclose a card

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

and a letter to Mr. Schuyler

with Erasmus and Peter as I
immediately ~~received~~ ^{accepted} the
of them so that when
I saw the shaft with
the base can be handled, but
I am not attempting to unscrew though
the shaft, the base will I am
not hesitating to drilling but
will be made.
I have also the parts clean
and wiped out, also the
valves so that we are
not having delay in pulling
the machine apart together. I
I intend to be seen as a

as it is very impor-
tant to provide for la-
bration in our first
handed boats with the new one,
I must hope to be able to
do all I am perfectly confident
that only a little
more time will
be done with me.
The machine O.K.
I have already found a
number of persons who
like the machine very much
as appears and I

shall derive the best re-
sults for the soil I know
of by the time I come
out. It is my chief
hope that I shall drill
for holes in the shaft
Plum have with the soil
which is being
used in the
mechanical together
at last

Hoping that we shall soon
have a thoroughly satisfactory
result. I remain

Yours sincerely

W. T. Allen

W. A.

shall derive the best re-
sults for the soil I know
of by the time I come
out. It is very likely
that I shall drill a
few holes in the shaft.
Plan here all the simple
machines which we may
need in getting the
minerals together and
at hand.

Hoping that we shall soon make further delay
have a thoroughly satisfactory and be necessary to take
things. I remain
Your sincerely

Wm. H. Harkness

to the

The Waldorf-Astoria
New York.

May 1, 1905.

My dear Mr. Scherff,

I intend to come

out to-morrow morning.

I shall be glad to see you

and will be very glad to see you

and will be very glad to see you

and will be very glad to see you

and will be very glad to see you

and will be very glad to see you

with Erickson to Peter as it is very impor-
tant to provide for the
of this so that when
I am the shaft with
the base can be handled with the machine,
do not attempt to unscrew though as they are
the shaft, the base will I am perfectly confident
not hinder drilling but only a little

and to make. I am sure that
which done will make

have all the parts clean the machine O.K.

and expect that, also the
valves so that we are

not having delay in putting machine of various things

the machine again together. The drilling was not

I intend to use steam as expected and I

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THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

CEO. C. BOLDT, PROP.

The Waldorf Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York May 8 1905

Dear Mr. Schaff,

I have just received your letter,
in regard to the measure you report
is being satisfactory to me. There
is no reason to suppose that
proper presentation. I am fully
convinced that Congress has
a great future. You will be
satisfied with the work
which is before them. The
is a 2 2. with 100 miles the
the long distance between

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THE WALDORF

THE WALDORF-ASTORIA, NEW YORK
HOTEL BELLEVUE, PHILADELPHIA
THE STRATFORD, PHILADELPHIA
SULLY BUILDING RESTAURANT,
PHILADELPHIA

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Co



THE ASTORIA

New York May 9 1905

Dear Mr. Scherff,

I was fortunate enough to solve the
important Coal problem today as expected
that the car will be delivered by the time
this reaches you. The good result is
unfortunately spoiled by a number of troubles.
Please advise me as soon as you are
in the position to get up steam. Would
like to get back for a day or two if it
be possible. If not I shall have to engage
a machine in New York. I think I can
get a good one from P. J. Reilly.

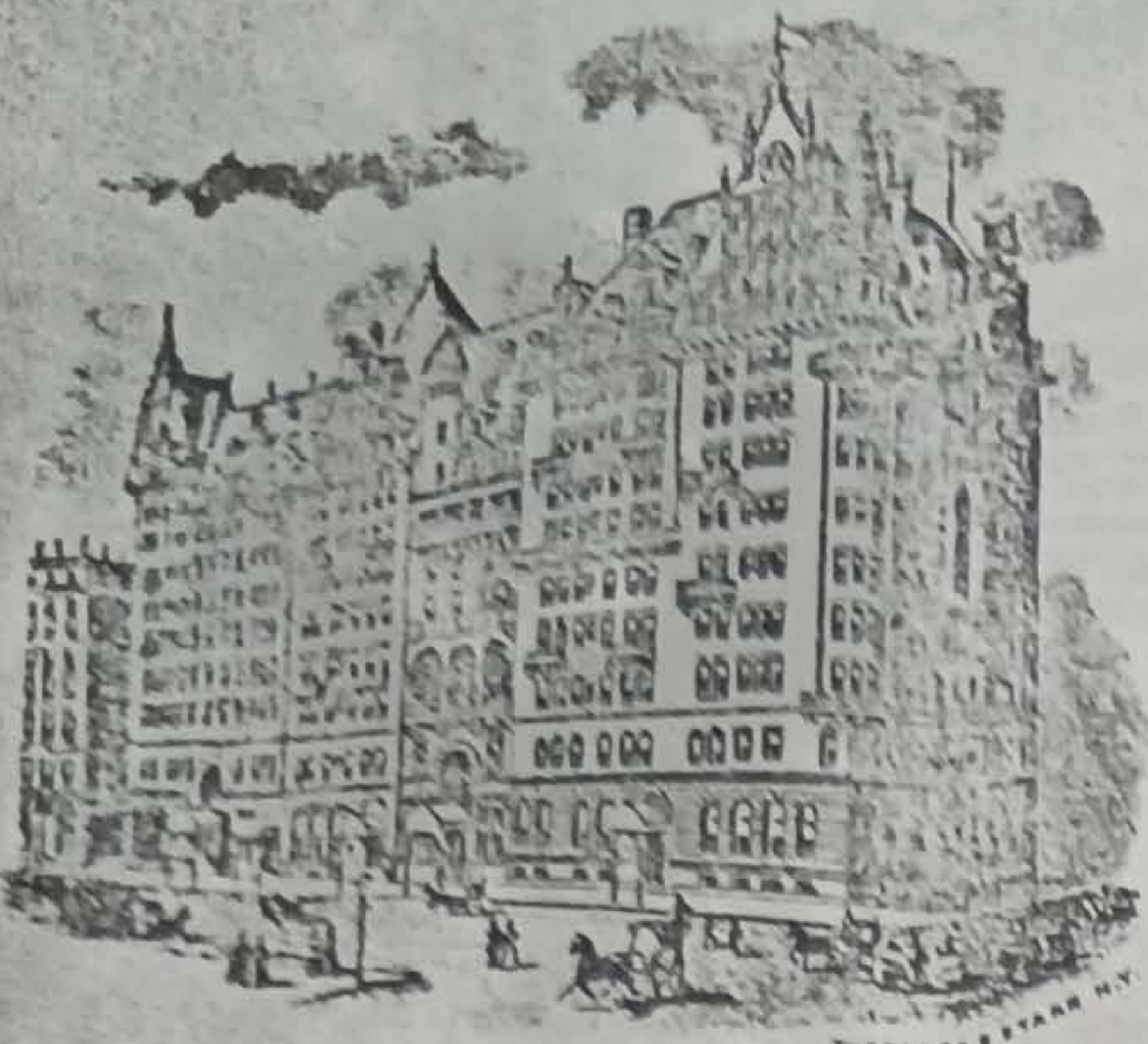
In order to avoid accidents such as
the last we shall have to take the
air from the top of the reservoir

interested of direct from the compressor as
to do now. Furthermore it will be necessary
to lay a small air line. I would suggest that
for the next experiment we use the smaller
of the two compressors for my compressor and the
larger reservoir in the corner (pipe 16" diam)
to the Regulator - Sargent Compressor. You
can easily change the pipe connection. I
repeat in order to avoid misunderstanding that
the air pipe for driving my engine should
come from the ~~top~~ ^{bottom} of the reservoir and not
from the bottom. Furthermore one of the new
rulers (2 connected) should be used for
lubrication. The experiments of the com-
pressor (Sargent Sargent) which are green are
not a good lubricant as they contain
much grit.

I am perfecting my plan for the next
test which I have will be much more
satisfactory than the last.

I have a plan to bring out Crawford as
soon as we have everything in shape.
He is a fellow with a big head and big
head and big head and big head with
big plan. Sincerely
A. T. T. T.

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BOLDT, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York May 16 1901

Dear Dr. Scherff,

I wrote this morning in relation
to some improvements on the
suspension. After a careful con-
sideration however I find that
under the present circumstances
a quick wheel is what I need
more. Accordingly I have exercised
my wish to make things so as
they are now, and would you be
pleased to receive in the upright
position, due to make the

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 PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
 and Astor Court,



THE ASTORIA

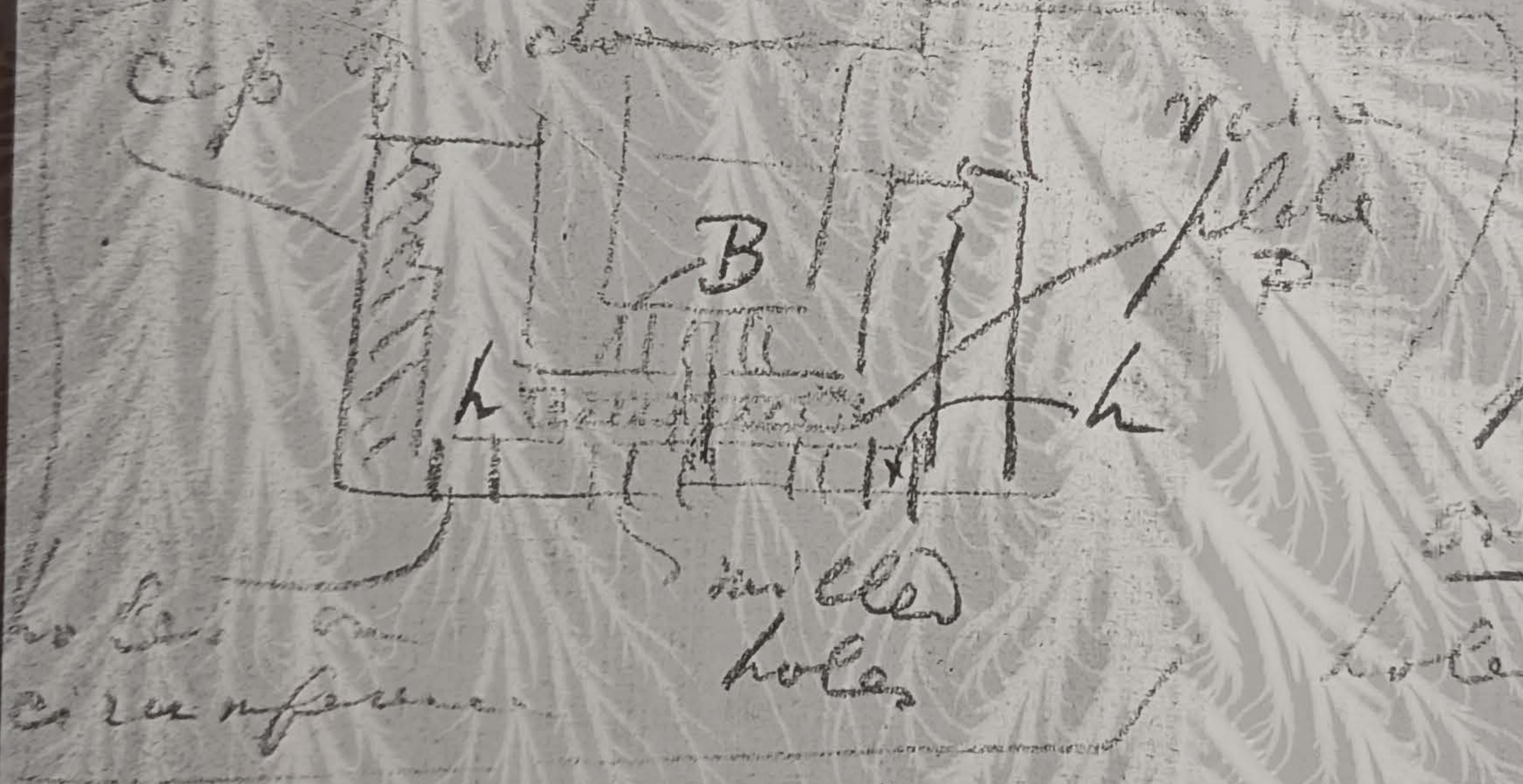
New York

190

It seems to me you are not making
 a mistake, only be careful
 in screening the right and left
 breast nipples, which form the
 vertical breast pipe and the
 compression casting. Do not forget
 the prophetic period! There should
 be at least one valve - the
 one preferred on the vertical pipe.
 If you will do this work
 a soon as possible I think
 the whole to the expression

the steps to the ... our friends very
 shortly without the necessity of color.
 some changes.

I discovered a machine on the valves
 as we used the last. The appearance
 valves were fairly good and were in
 a state of trouble, but the section
 valves were as really cut not
 worth. You will see this readily
 from following sketch.



However, the
 construction
 secured in
 the chamber
 the air would
 out through
 holes h h and

There is a hole h from the valve
 plate P against stem
 the valve not properly in place P should
 have been of such diameter to cover a portion
part of holes h h as was the case in the
first trials. Due
 W. T. Earl

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
 PHILADELPHIA CABLE ADDRESS "BOLDT, PHILADELPHIA".



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
 HOTEL BELLEVUE, PHILADELPHIA.
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GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
 and Astor Court,



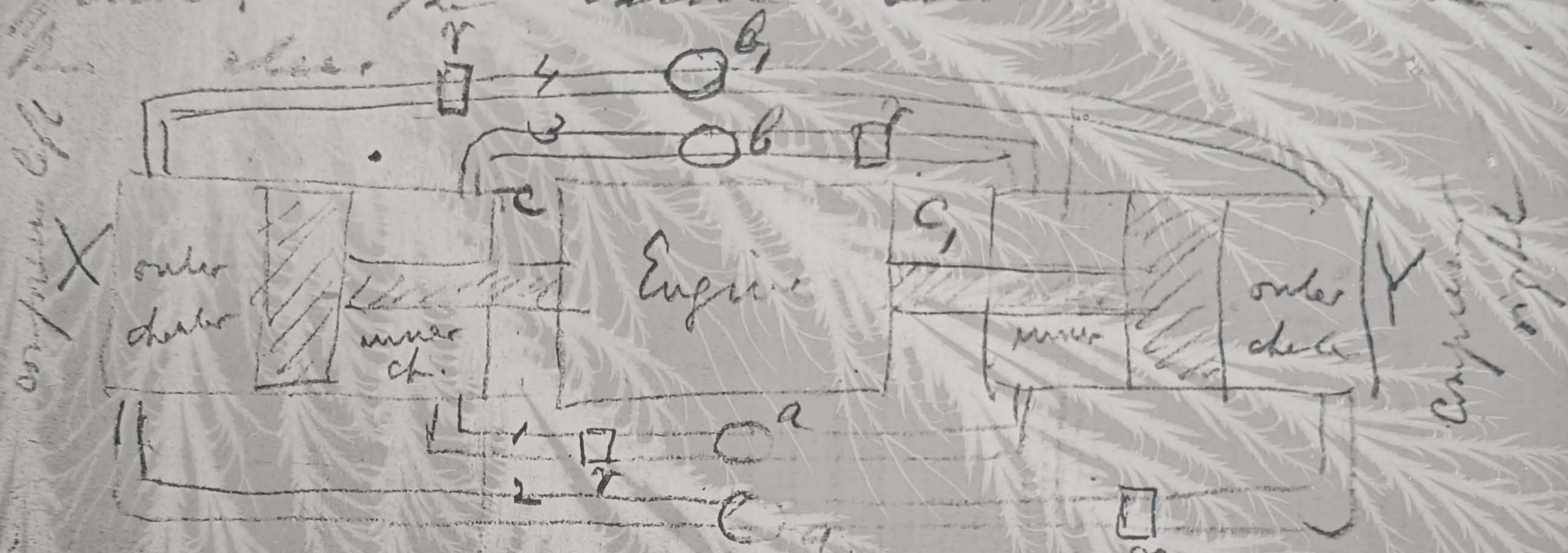
THE ASTORIA

New York May 16 1905

My dear Dr. Scherff,

After carefully considering the
 various suggestions on the compressor
 I find that the valves should have been
 connected differently, in a manner I
 first intended. Namely, there should be
 but one suction and one compression valve
 for each pair of pressure chambers which
 are corresponding. I am sure that the
 advantage and also the order of
 connection in pairs, both
 suction and compression and
 the order of these four

chamber there is a valve (for suction
 or compression) then, no matter how
 any of the valves may work the two
 adjoining compression chambers will be equally
 affected. The sketch below will make



1, 2, 3, 4 common chambers, a a, suction
 valves, b, c, compression valves.
 the arrangement of this kind will secure
 a perfectly balanced engine. Furthermore it
 will reduce the mass of moving parts.
 More important still, it will make
 the valves work more easily. The
 main twice. The
 there are also advantages of
 there is that there is a certain increase
 of waste space. And it is that it

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Fifth Avenue, 33rd and 40th Streets
 and Motor Co.



THE ASTORIA

New York

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is advised to not the connection.
 But by all means the improvement
 should be adopted for many reasons.

With the change of position it will also
 be easy to place the piston by narrow-
 ing the passage of the proper pistons and
 outlets for the chambers. To indicate suppose
 that X be the lower and Y the upper cylinder
 the machine is vertical then XXX
 will be such adjusted plungers.

In addition to this I find that
 cushion for the cylinder should be
 employed as I also planned originally
 in cushion CC, with these improvements the compression

will work perfectly safe & in every way
satisfactory in the upright position.
I am enclosing this work vigorously &
expect to give you a pleasant sur-
prise when you see the machine at
its operation.

Trouble is a matter of course. I am
not present at the machine. I am
I have some hope for the future. I will be out
in a few days. In this case I shall use
the machine.

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The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Motor Court,



THE ASTORIA

New York May 17 1905

Dear Dr. Schuff,

Your letter has just reached me.
I am glad to hear that you are
doing well. I am
the good one.

It is tough to think that
the millions have waited a day
but the money is not
paid yet. I fifteen days
he ought to feel better or else
be very sick.

I shall be able to come out

to-day (Thursday) evening, I am sorry
to say the problem in the case of the
changes I have been presenting has
remained too difficult.

You are right that the construction can
be simplified and that it would be
convenient to put up the valves. Special
fixtures are necessary for the changes pro-
posed. That the machine will work
right with the valves and program in
position. The changes
proposed are for the
can be carried over.

Yours

W. F. Cook

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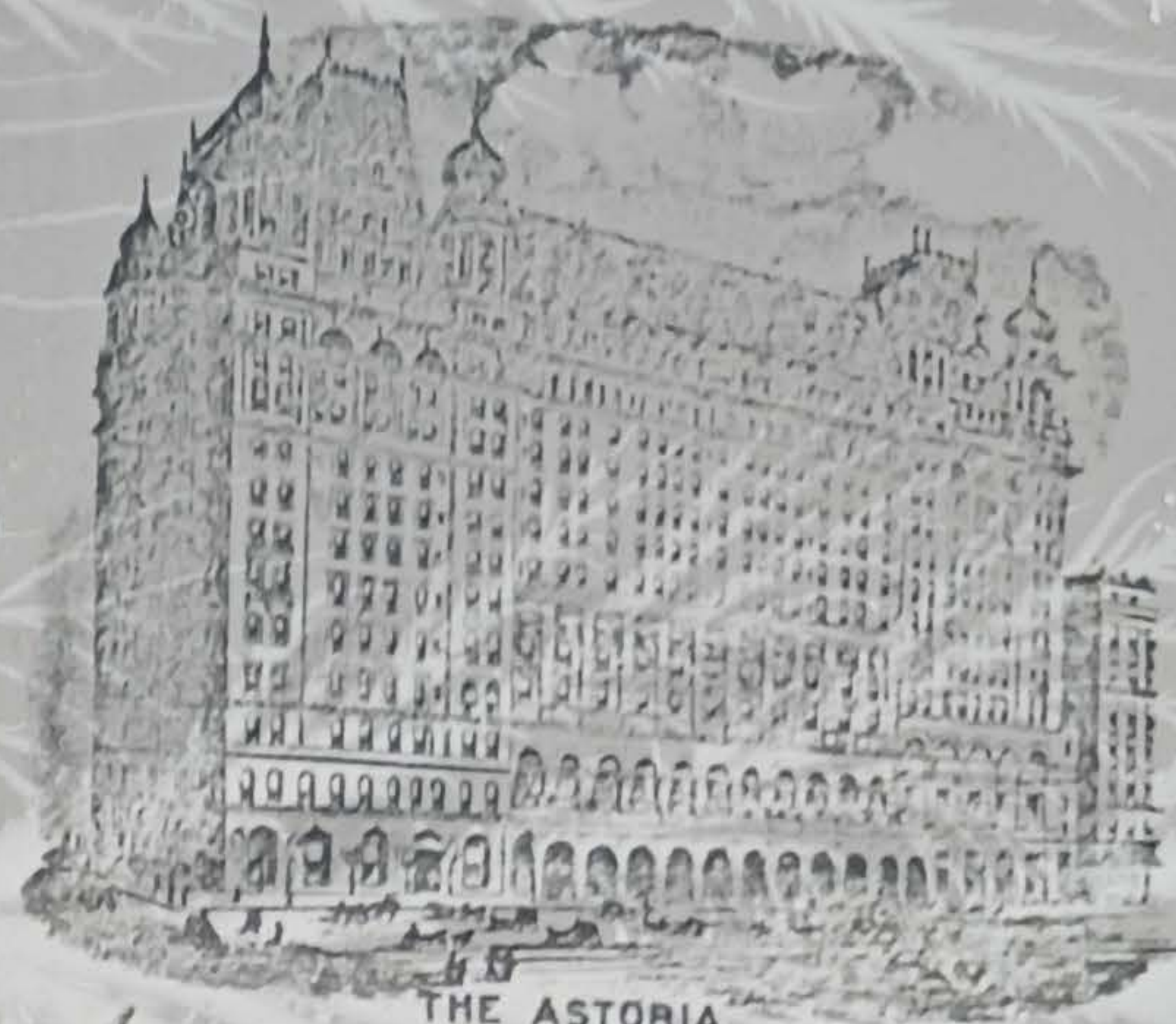
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PHILADELPHIA.

GEO. C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York May 17 1905

Dear Dr. Schmitt,

Your letter has just reached me.
I am glad to hear from you and
am doing well. You are a
kind man.

It is tough to think that
the National League would a day
but the players have
been here. I fifteen days
he ought to feel better or else
be very sick.
I shall be able to come out

to-morrow (Thursday) as yet, I am sorry
to say. The problem in the case was solved
although I have been successful in
unraveling the trouble.

You are right that the connection can
be easily made but it would be
troublesome to put up the valves. Quick
pictures are necessary for the changes pro-
posed. But the machine will work at
right with good valves, as proposed
present. What is needed is an
envelope or for it. The changes
can be carried on later.

Yours

V. F. Fiske

Stumble in
I think
before
on

The Waldorf-Astoria
New York.

May 22 1901

very
impression

Dear Mr. Schmitt

but you
have
of

I have thought care-
fully over the experi-
ments with the me-
chanical part right and
have come to the con-
clusion that the acci-
dent is well as the
preparation of the scene

boldly
I think
for the
The

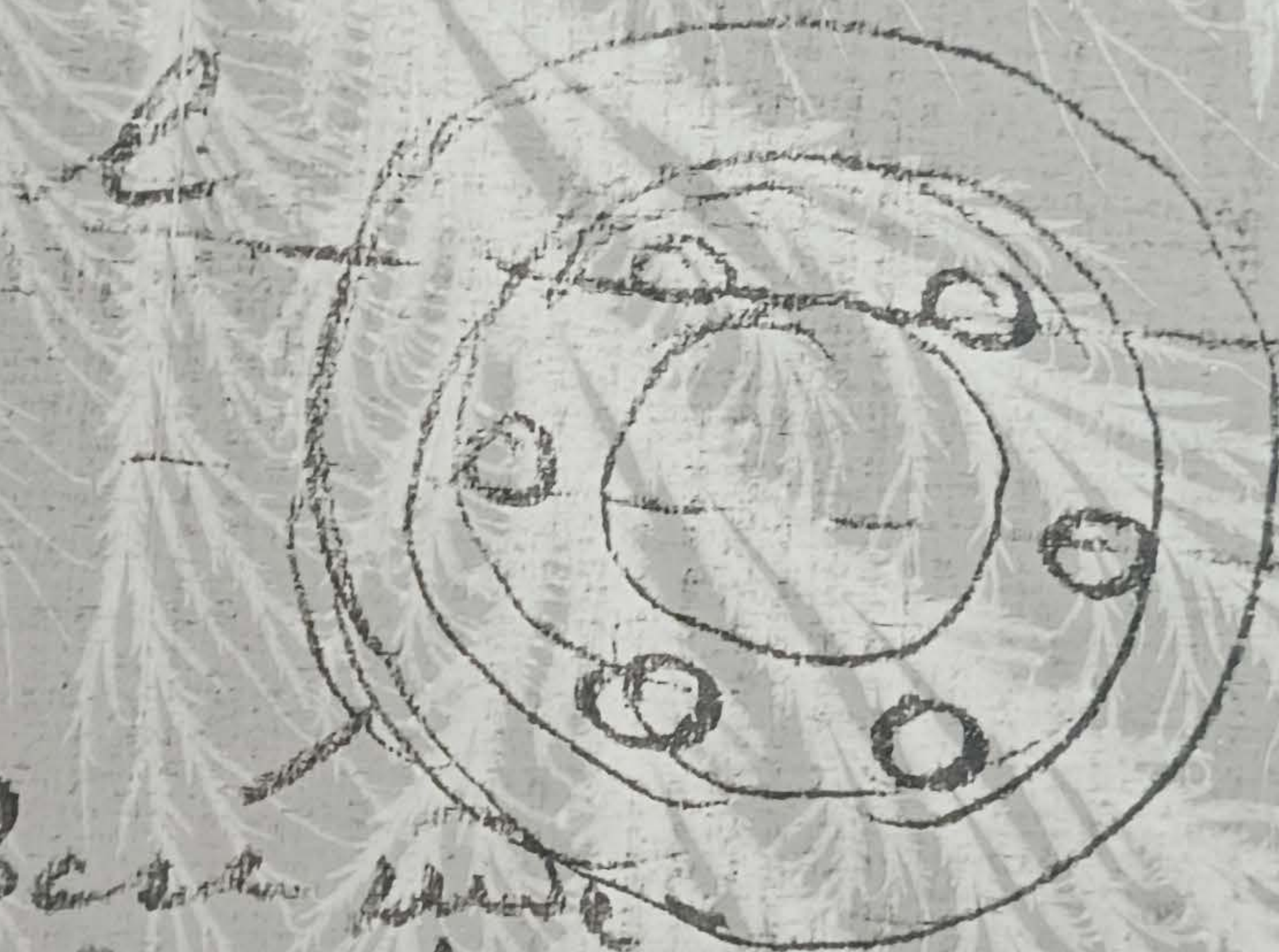
U

and vessels from — Peter
social — Energy —
any — all sort —
largely of the form —
are — are —
carried out well —

I hope you have made —
and are about the first —
thing of the independent —
base to the current flow —
by the holes and —
a piece of thick paper —
or card board and the —

De

11/11/11



Beast and

Brown leather
attached to
Tupper
Company.

The ~~books~~ ~~are~~ ~~each~~
have should be date

~~One~~ One *inlaryne* *assides*.

minutes of plumb line
from roof. I think
you did this before.
Center stone to on

a line of symmetry in
the symmetrical compression.

I calculate that you
will find the stone
about $1\frac{1}{2}$ " deep and

will lead me to bolts
according to I think

$1\frac{1}{2}$ " bolts under the
head and so. The

and now and then

7/1

Stop! We should have
the steam capstan
engine shell on an
arbor as far as
will be a turning of
you will then seem
the hand spots which
you can find down
Repeating the process
you will do as
well as Opie can you
ever make it with
him

the position of the circle
low should be done

the more independent beside,
Put On The staff of
your course you will have
an
it to slip on the
in of, for the a piece
down in the long. One
which you began you will
down son be absorbed
over in the interests with
for which I am
come you for I shall
with have a careful

had well do. The for

Lin here is the
man who is

Shed Peter get through

the the looking paper

Stone in the night

first

will write again

Can you see the

from the for

has of telegraph

many

in last

W. T. S.

minutes of plumb line
from roof. I think
you did this before.
Center stone to on
a line of symmetry in
the symmetrical impression.

The Waldorf-Astoria
New York.

May 22 1901

Dear Mr. Schmitt,

I calculate that you
will find the hole
about 11" deep and
will send out bolts
accordingly. I think
of 6" bolts (under the
head) and so. The

I have thought care-
fully over our experi-
ments with the me-
chanical bolt right and
wrong for the con-
struction that the cur-
rent is well as the
position of the screw

has been in the
meantime.

Should prefer get through
the the looking paper
and should be through
first.

Will write again and
come out as soon as

possible for
news of telegraph

Travelling

in looks

W. T. L.

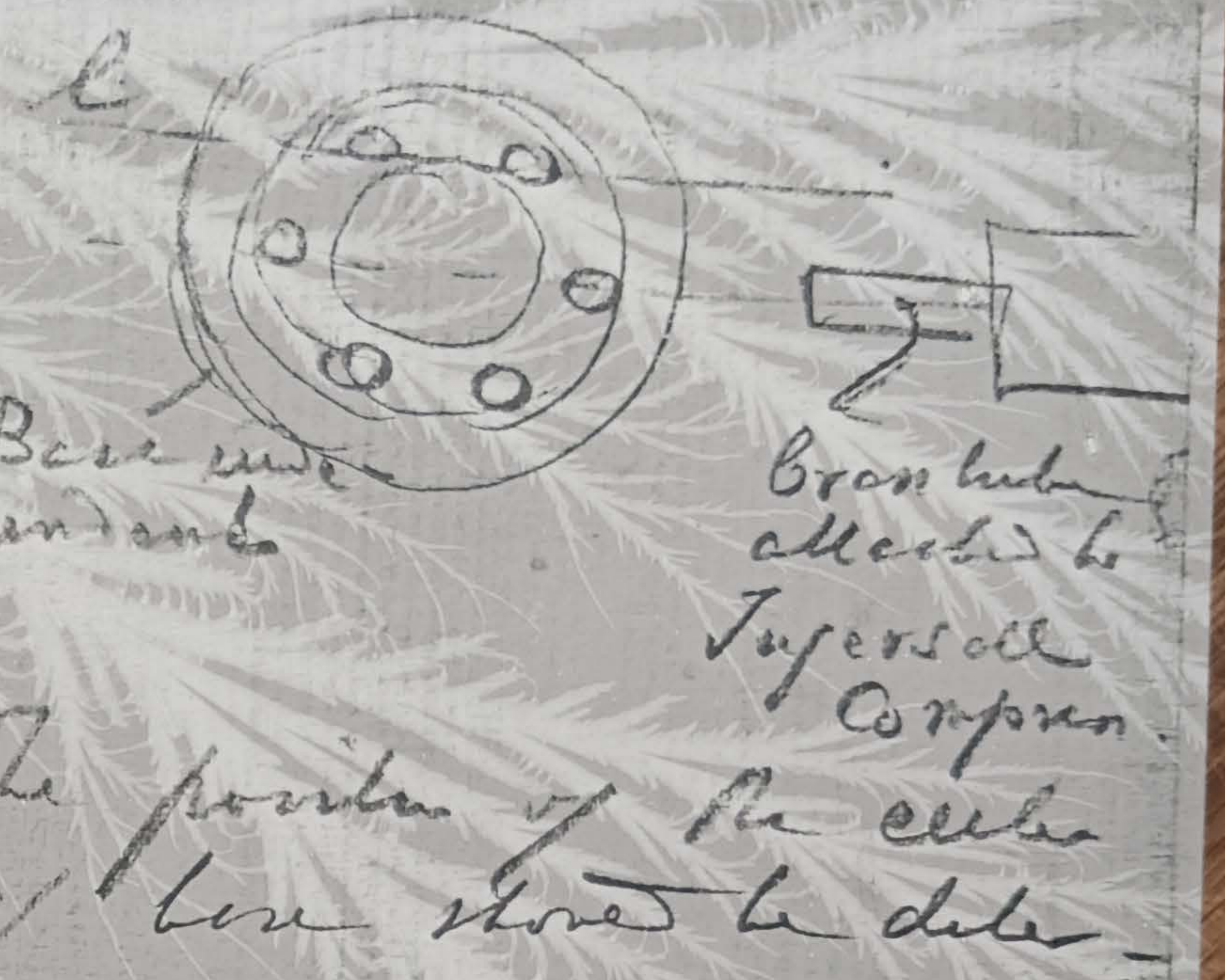
The Waldorf-Astoria
New York.

have you had the
in 4 1/2". This will
be 5 1/2" - 3 1/4"
for hole. Will
express the bolts and
some lead to cover
the joint and
will the construction
which the lead goes
on the sleeve and
perhaps also on the

removed from a
 solid ~~material~~. Energy
 Ray I believe will work
 perfectly if the fan
 has improvements on
 carried out well.

Peter can drill. The
 line forming the center of
 the fan has never to
 be. will show to possess
 a better. Look this;
Wall

I hope you have under-
 stood all about the fan
 wing of the independent
 base to the cement floor.
 Lay the holes out on
 a piece of thick paper
 or card board and the



Brass tube
 attached to
 Tapersole
 Company.

shaft you should ~~also~~ have independent beside
 it. Put On The shaft of
 the steam (cylinder
 engine shell) on an
 arbor as far as it to slip on the
 vice p and turn it piston and proceed
 you will then see a mark. Once
 the hand spots where you begin you will
 you can find down soon be absorbed
 Repeating this process in the already work
 you will do as for which I am very
 well as Opie can you for I shall
 ever make I will have a capital

leaves
full
to the
end, the
the various
enches a
under high
then
of back
I expect
is a
of a single
opening
on the
arrangement
not change
it back
for reason

obvious 3/ Sept perfect 4/ letter
being of person 5/ on nose, 6/
As strain
on colors
I believe can be
satisfactory.

The Waldorf-Astoria
New York.

May 23 1905

Dear Mr. Schuyler,

I will please you
to know that I have
found an error in
the plan and also that the
building is being
completed. I shall
have it completed in
the next few days.

The hole was
 small and so calculated
 as to fit the
 penguin's bill about
 half an inch. There
 was a space left
 between the two
 which was
 filled with
 bark or moss.
 The hole was
 made by the
 bird itself. It
 was found in
 the wall of the
 nest. The hole
 was about
 half an inch
 in diameter.

will be so calculated obvious
that the full being
compression of 100 lbs. as shown
of the is shown, the volume
air which still remains in the chamber (between a
valve passages) under high
compression will, when
the piston ~~is~~ ^{is} back
away from valve B) expand
to ^{the} ~~the~~ ^{far}, that it is a
little below the atmosphere
the pressure then appearing
is reached. You see the
advantages of these arrangements.
1) The suction valve must always
draw, can not push air back
2) Compression is high for reason

will be so calculated
 that when the full
 compression of 150 lbs
 of steam is obtained, the
 air which still remains
 in the chamber (between &
 valve passages) under high
 compression will, when
 the piston reaches the
 away from valve B) expand
 so far, that it is a
 little below the atmospheric
 pressure when opening
 is reached. You see the
 advantage of these arrangements.
 1) The suction valves must always
 draw can not give out back
 2) Compression is higher for reason

obvious 3) Sept perfect 4) little
 being or parts 5) by some, 6)
 Air stream The Waldorf-Astoria
 in value. New York.

May 23 1905

Dear Dr. Schmitt

It will please you
 to know that I have
 found an error in
 the design of the
 suction valves. I shall
 correct it immediately
 and send you the
 corrected plan.

[illegible]

The Waldorf-Astoria
New York.

May 23, 1905

Dear Dr. Schmitt,

I wrote about
holes in the house
last night of the
comparisons as how
they are to be
drilled to improve
the action
was I did not

[illegible]

for the
to drill here one,
which
may please give
me the same
I return mail.
I think there is for
as the lower country
is connected looking
from below the
perhaps being the hill side
the about the slightly
as shown in the
which shows the

I have been
on the left,
I right? This is
all the necessity to
know for the top can
be turned as we like,

Respectfully
Yours

W. T. G.

W

I have written the
 on the left. I am
 I right? This is
 all the necessity to
 know for the by can
 be turned as we like.
 Really yours

Truly yours

W. T. G.

M

The Waldorf-Astoria
 New York.

May 23, 1905

Dear Dr. Schmitt,

I wrote about
 holes in the bronze
 castings of the
 compressors as how
 they are to be
 fitted to improve
 the action
 John W. Schmitt

recall how the
compression and volume
values are related
with reference to
the marks on the
compression curves
sent to the Allen
Boyle. This is
a very important
order. I have
been about the
house. I hope
to finish the

as drill near ones,
and you please give
me the 1000 feet
of volume mark.
I think that is for
on the lower cooling
is connected looking
behind that is,
the side with
which the sample
is taken in, the
shell

engineering skill.
Six bolts will be
enough, the other
has an reserve.
Can I call on
you for drilling
the holes in the
beam - I mean in
the base of the beam?
There is something
the is capable

The Waldorf-Astoria
New York.

May 23. 1908

Dear Mr. Schuch,

I have started
the work to-day
I hope the
program will
be - now I can
come out to-day
after I will go
to the building of

Sag - one inch, the
melt lead to make
it very hot. Pour
in some lead - sag
enough to fill half
of each hole. When
the casting is in place
after that the latter
can be removed and
the holes filled full
finally a little larger
drill can be run through
the holes in the ceiling.
Please do as much of this
as you can. Sincerely
W. F. C.

The Waldorf-Astoria
New York.

of showing the exhibition
of any secretary the
ever has. I would
proceed as follows:
First I would lay
out holes on a piece
of cardboard or thick
paper. Mark the
centers of the holes on
the casting. Mark
them after the one

I find Hobson all right in every
Fridge here is then respect.
for my services I expect to
appear at the day eight bolts
place of my son-in-law. Also but and tobacco
The one I think is better drill for
the improvement of the canal floor and
are being carried on in the summer. As to
the more I am trying to the
concrete the the holes I rely on
machines will be your well demonstrated

The floor with the
drill the holes
to the depth required.
Then put the bolts
in their position.
Then put the castings
(being in its place)
with the bolts passing
through the holes -
supported by the
drilled by hand power above the castings

There is also the
rub comes in. It
would not pay to
run the engine just
for drilling six
holes $\frac{1}{2}$ inch in
diameter through $\frac{1}{2}$ "
of cast iron.
Suppose this is all
done at the
the bolts are
all sticking out
above the castings

skill,
the wife and
the other
reserve,
call on
drilling
in the
new
the lawn?
something
capital

The Waldorf-Astoria
New York.

May 23. 1907

Dear Mr. Schuch,

I have started
the work 6 days
before the
the program will
be in 2 hours I can see
come out as today
after I have for
the meeting of

which, then
to make
of our

The Waldorf-Astoria
New York.

of showing the exhibition

My friend Hobson, all right
Friday night is then - respect
for my earliest I love
appearance at the day
place of my sorrow - but
The more I think of it
the more I think of it
and being carried away
the more I am happy
convinced the the day
I shall be the your

The floor with the There is

and Hobson, all right in every
is then - respect,

certific
I expect
at the day eight bolts
by some bolts as
I think as bolts as bolts
moment, what the drill for
comes my the usual floor as
I the hammer. to be
the the I rely on
will be your well described

There is also the
the comes in. It

engineering I shall
Six bolts will be
enough, the other
has a reserve, less
Can I call on
you for drilling
the holes in the
beam -) near the
the base of the beam 2 ft -
There is something
the is capital after

Sag - one inch, the
mild steel to make

The Waldorf-Astoria
New York.

of showing the contribution
by any secretary that
ever has. I would
proceed as follows:
First I would lay
out holes on a piece
of cardboard or thick
paper. Mark the
centers of the holes on
the cardboard. Mark
them after the on

needed will be your

The floor with the
take the ~~floor~~ ~~down~~
to the drill the holes
to the ~~right~~ ~~required~~ run
Then ~~the~~ the holes
in the ~~position~~ ~~down~~
Then put the ~~center~~
Chisel in the place
with the ~~holes~~ ~~passing~~
through the holes -
support to be
drilled by hand bone above

we be your well deservings

There is also the
the cones in. It
the holes would not pay for
required than the expense just
balls for drilling six
holes $\frac{1}{2}$ inch in
diameter through $\frac{1}{2}$ "
of cast iron.
Suppose this is all
the necessary work at that
balls - The balls are
all sticking out
and above the casting

Sag - one inch, then
melt lead to make
it very hot. Pour
in some lead - sag
enough to fill half
of each hole. When
the lead is in place
pour the solder
over the lead.
The holes for the
solder are full.
Finally a little larger
drill can be run through
the holes in the casing.
Place the casing of the
cylinder. During the time

bellas fit of the copper
protrude. They were
altogether too loose,
we polished them to
many times. But they
have been close fitting the
last accident case
that have occurred.

The Peace people
are asking what an
improved receptacle
of steel. They will
not want better

The Waldorf Astoria
New York.

May 24, 1905

Dear Mr. Scherff

I wire you this
afternoon to send
me the two (certain
and packing) brass
connections. I have
designed a good scheme
for giving to the
tubes between the

draw it out of a
rock.

Please by D. draw
the work there as much

as you can. There
leaking pipes in
front of the engine
room. The whole system
is leaking. I am
going to have the
pipes replaced by
new ones. The whole
system is leaking.
I am going to have
the pipes replaced by
new ones. The whole
system is leaking.
I am going to have
the pipes replaced by
new ones. The whole
system is leaking.

The Waldorf Astoria
New York.

Dear Mr. Scherff

I expect to provide
a supply of the
pipes and will
have the work done
for the oil line.
I will also furnish
slugs with holes
in the exact places
for drilling the bronze

Sincerely,
J. Scherff

The Waldorf-Astoria
New York.

May 24, 1905

Dear Mr. Scherff

I enclose you this
exploration to send
on the two (entire)
and primary basis -
consequently I have
drawn a good scheme
for giving the
rules between the

The Waldorf-Astoria

the
I shall also have all
/mils ground, the same
that the 1000s sold
and everything else that
my be necessary done
to have the best, I
the best but I shall
Something curious to
complicated to explain
to you showing that
we had been back.
The few other people
are holding the steel -

the
here all
the same
sold
else that
may draw
back, I
I should
visions to
to explain
ing that
backs.
people
the shell -
Dingo for the authorities.
After couple considerations
which I found that
the same hole, in the
bushy
the comparison
is difficult to place
the present bushings
as to order new ones
which will be furnished
to-horror. The new ones
will remedy the backs
of the inspector, also
permit taking

a few days delay but
have no
renew

①
bells of the copper
brother. They were
all together in one
the whole of them to
many times. But they had
been close during the
last accident and
they have occurred

The Peace people
are taking her as
important relatives
of the. They are for
good and better

②
draw it out of a
rock

of 6

The Waldorf Astoria
New York

Draw
the 12 old for
dimensions of doors
I appear to provide
a copy of the
plans and will
have the holes in iron
plates for the rollers
by which the furnace
slugs with holes
in the exact places
for drilling the bronze

are making the steel - per

⑥ bushings. I am
trying to find out how
good as much as
possible.

My conclusion is that
with all these things - The
elements the machine the
little power a great many
things in the way
of from the changes
are here extremely
than I thought of
first and it means more

people of the interior, also
shall - permit holding

as a few days delay but
I hope the report
will be commensurate
is the to our sufferings.

trip - The next time we put
have the machine together
graciously ought to be a

four days. But
change I have the machine

in good shape I can
do with many other
things did with other

and will be

⑥ ⑧ to draw it out of a
rock

Place by  a

work them as much

as you can. That

looking of the

in the

we can see that the

into the

turn in the

ch. to an

are I am going to show

Remember the

find words in the

in condition

Every

to

As I understand the
matter the men will
be absolutely to handle
in many is starting
a dropping in the
entire position.

I don't see a lot of
① more but right the morning last night and
the first of the company that will
persons must be put in the hands of the
We have not sufficient to the defection action
entirely as they are of the values. This will
be obvious in the
last values we are to
and you will be interested

The Waldorf Astoria
New York

May 25, 1905.

Dear Mr. Scherff,

Truly yours

W. H. H.

You will be interested

that when the surfaces
were dry the valves
would ~~be~~ better
than they were not grown.
I calculated for the various
valves in and succeeding
the forces necessary to
operate ~~to~~ found them by a
little for work and
begin to operate by a
stroke of about $1\frac{1}{4}$.
For smaller strokes they
would become inactive
or at least irregular
in their response. When

the stroke became full
then of course this de-
fect was ~~eliminated~~ and
the ~~per~~ ~~disappeared~~.
The new valves will
operate surely even
when oil gets in
by a stroke of less
than $2\frac{1}{2}$ of an inch.
And for a longer stroke
their action will be
perfectly regular.
I feel sure that the
machine will work ever
so much better than before.

The Waldorf-Astoria
New York.

May 25, 1901.

Dear Mr. Schaff,

I do not
be that thinking
that
the defect in
of the volume. This
is observed in the
last volume we are
last.

You will be interested

that when the surfaces
were dry the valves
worked well and better
than by sea water.
I calculated for the various
valves in each successive
the force necessary to
open them from the
the last for both of
begin to open by a
stroke of about $1\frac{1}{4}$.
For smaller strokes they
would become as a valve
or at least irregular
in their response. When so

The whole been full
The of course that also
but this is all right

The for ~~disappeared~~
The same volume will
appear surely even

then oil felt in
by a ~~thick~~ as in
of ~~the~~ $\frac{2}{3}$ of ~~the~~

at for a large whole
their action will be
perfectly regular.

I feel sure that the
machine will work over
so much better than before.

As I understand the
matter the same will
be absolutely to handle
in many is starting
& happening in the
vertical position.

© and but right that the
position of the
position of the

We have had sufficient
enthusiasm as they are all
of the

Truly
yours

Truly
yours

Yours
yours

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PHILADELPHIA CABLE ADDRESS, "BOLDT, PHILADELPHIA"



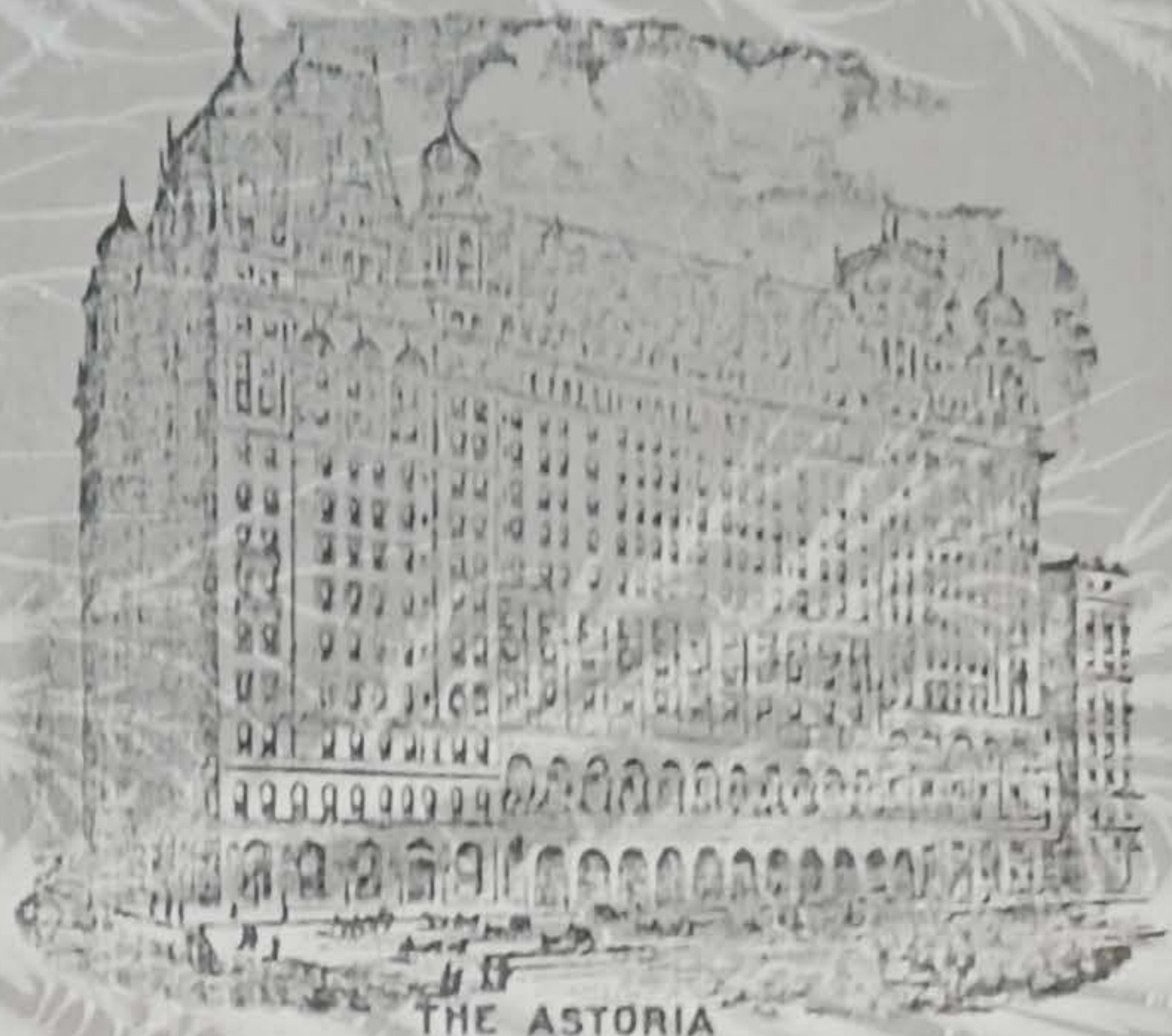
THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

CEO. G. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 330 and 34th Streets
and Motor Court.



THE ASTORIA

New York May 27 1905

Mr. J. Schuyler,

I have been looking for work
The Hotel -
Wings for cashiers have been posted
on the Congress Commission at the time
before the Commission was made. The
Commission is the Commission which gave
us the Commission of the Commission
up the Commission. The Commission
booming in great hurry at it was very
defective. Everything about the Commission
will be over the Commission and chief
of all we shall see the Commission
the filling up the Commission is close. I
have bought several pieces of Commission

[illegible]

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS, "BOLDT, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.



THE ASTORIA

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor

New York May 23 190

Dec 2 1892

Save Ad 3. 20.
1000 in face up to 1000.

1911

Handwritten: *Handwritten*

1. ~~Not a member of the club~~

100

1947

222

Rec

A black and white photograph showing a close-up of a rough, textured surface. The texture is irregular and fibrous, resembling a wall of coarse fabric or a natural material like bark. The lighting is somewhat uneven, with darker areas in the upper left and lighter areas towards the right. There are some small, dark spots and fibers visible throughout the material.

2000

1911

Handwritten scribbles and marks at the bottom of the page.

2/11/1911

Alma

23-11-1950

11/16/68

2.

1891

10/10/10

simply suspected. This position
for four some way he lead in.
Then you can see the base in
place. I would find 17. In fact
the holes. The [unclear] [unclear] [unclear]
base any [unclear] [unclear] [unclear]
up the [unclear] [unclear] [unclear]
Reports of [unclear] [unclear] [unclear]
program. The [unclear] [unclear] [unclear]
the [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear]
R. [unclear] [unclear] [unclear] [unclear]
by [unclear] [unclear] [unclear] [unclear]
are working on the value plates.
I see [unclear] [unclear] [unclear] [unclear]
to [unclear] [unclear] [unclear] [unclear]
to be [unclear] [unclear] [unclear] [unclear]
be [unclear] [unclear] [unclear] [unclear]
from [unclear] [unclear] [unclear] [unclear]
not look well. The [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear]
[unclear] [unclear] [unclear] [unclear] [unclear] [unclear]

hope is necessary to get the threads
I am disappointed but I mean to win

from you this evening I hope to learn
the cause of the trouble that you
have been doing since we have been the
freedom of the world.

and looking again at the next history will
be of the Phrygian bronze I anticipate
the history will be a very

of the past. But I think even
the seven or eight days
of the day

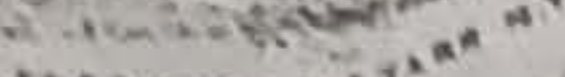
head of the
from becoming for the day I have
been a little

in particular that is
the history of the day

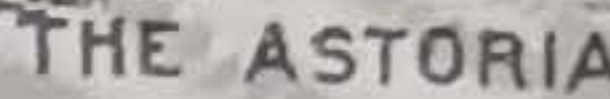
looking into the company
of the day

the less steps I have taken

PHIA



hree



THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PROP.

New York

190

[Faint, illegible handwriting throughout the page]

[illegible]

anxious I am
he best again. I
will be over to
letter to the

The Waldorf-Astoria
New York.

June 10 1900

London ever to me. I
very much. I
much, right to be
your letter. I
which I have

Mr. Schuch
By coming out to
and the point and
to

far or color upon
a new phase.

Enclosed I find
the paper on our part
giving no capital
be hardly for this
I wish to see
an experience which
to be sent on
a question. I am
disappointed. I

May lead up to I can think of the
of course, I will be the first to
now. A number of people are going
interesting people, and I am sure
the people. I am sure as I am
The work is progressing. I have to get the
will be as I have before for a number of seasons
to still be the same. I am sure it will be
get the machine, and I am sure it will be
better by the way. I am sure it will be
I am having some trouble in getting it to
work, in fact for some time. I am sure
the machine is working. I am sure it will be
The two men at the house are working
on the other side. I am sure it will be

The Waldorf-Astoria
New York.

June 10 1900

Dear Mr. Schuyler

I am writing you to
say that I have been
very busy lately and
have not had time to
write you before. I am
sorry to hear that you
are not well. I hope
you will get better soon.
I am writing you to
say that I have been
very busy lately and
have not had time to
write you before. I am
sorry to hear that you
are not well. I hope
you will get better soon.

May be up to 1000

of course the more the better

now. A number of my

interesting things are in the

the way of

The work has progressed

well but as I write before

be still the same

but the method of

getting the material

I am having some trouble

in the way of

the material of expression

The two minor D R R

order values will be

I can form together to Mr
to tell them with the
of very to his composition groups
are in which as we have

connected as we have
I have to get his scheme
before for a number of reasons
I will fully explain

When I come out, I expect
to be there in some form
much as before which it is
not intended. We do not
need any more as the
mechanical side is ready
You can imagine how

Answer I am to have
be last year. Every
will be over the
letter to the chief
traveller every to an
day around. The
amount of the land
and the number of the
people in the
for an entire year
a new place.

Traveller
The paper on one hand is
giving no capital letter seen
in handwriting the domestic
express

shall, but I do not
 believe that as they are
 now they will be able to
 do the strength and
 being used and through
 on the place, then the
 screws are located. We
 shall of course have the
 improvement for the look
 to be the main side by
 the valves it can be
 easily overcome, then
 the next thing I propose
 to connect the two
 how, but not a small
 reservoir, having one

The Waldorf-Astoria
 New York.

June 11, 1905.

Dear Mr. Schuyler,

Respectfully I feel that
 I am not the best person
 to write for the day. It would
 be better for me to go. But
 after all, as things are, I
 cannot do the work as I
 want to be a possibility.
 I am sure - that I might
 be willing to contribute
 to the cause, on the
 day.
 I shall be glad to see you

I hope you will see them as they
 are and not as they are
 shown. I am sure that
 of the steam chamber, as a
 region of the steam chamber
 there will be connected to the
 main air. If any steam
 escapes along the shaft
 which is not into the main
 not in the main chamber
 up, now. This is a very
 serious. I was almost
 before I hit upon it. We can
 heat cool the compressors and
 the more, the better.
 I will be very glad to see
 you of course in Brooklyn, New
 Saturday June 10. Not bad but
 I would prefer to see you
 Sunday at Ten

The Waldorf-Astoria
 New York.

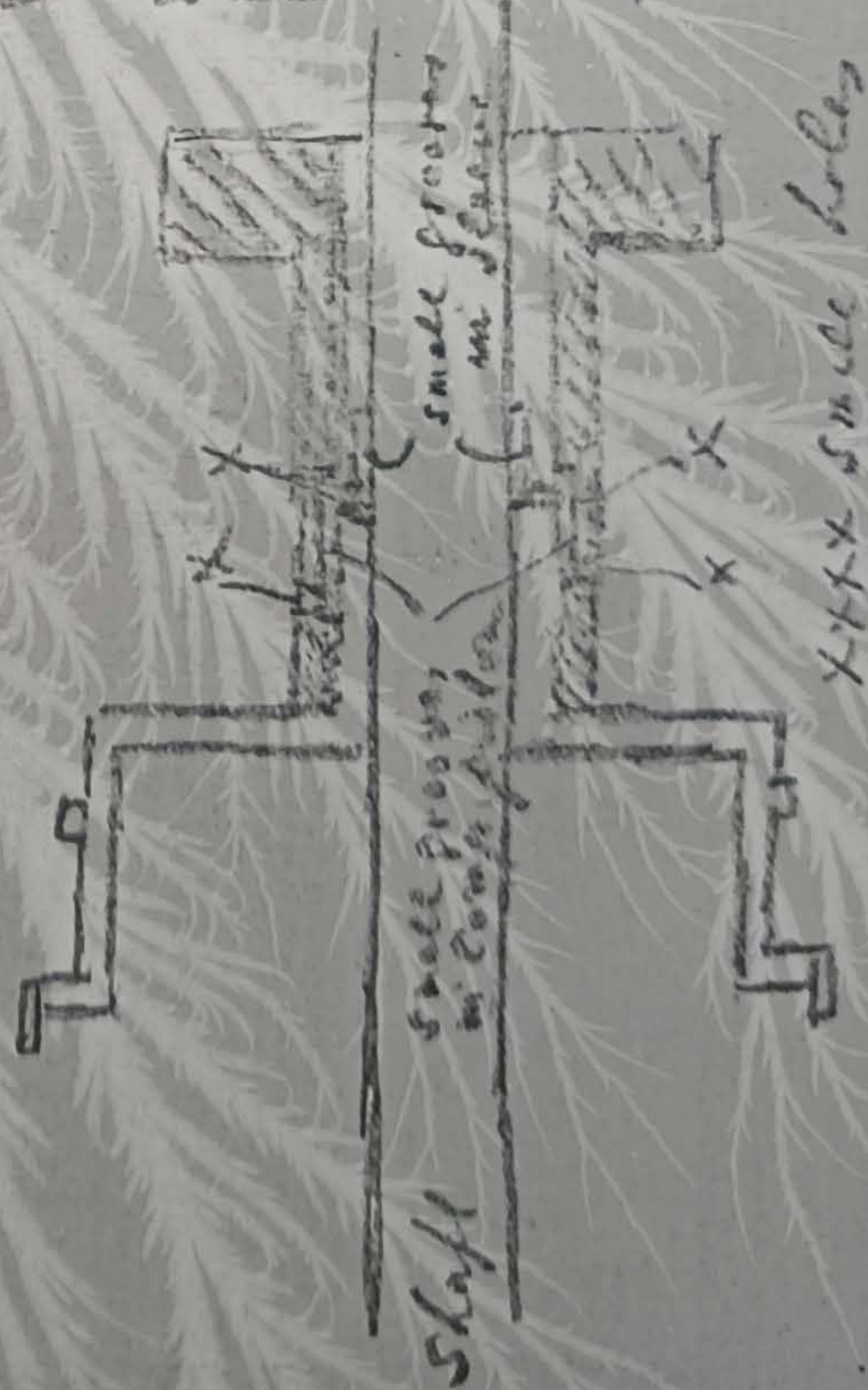
I am sure that
 the air can get in. If
 we can not find a way
 we can use a large
 pipe leading up to the
 roof or simply lead
 on the ground. The com-
 pressor outlet tubes being
 connected to a reservoir
 the more can and be great.
 I shall leave the Peoria
 people have the shape
 and pieces and making the
 great things so that

The machine is complicated & has no doubt in it that the human mind cannot understand in that we only need to put it together. The reason people have been hard to get at it but I can not tell you where I shall come next for we shall be by and get there. It is to some extent. I am not getting in and out of the machine as yet. It is responsible for to explain, he will report the sound. It seems as if the pressure of the thought being started would then for getting into the wings must be higher. compression chambers.

Now only you look I have arranged myself for the use of the two thickens - it is not the same different wings on the ends of the machine the device of

as my have a machine perfect for the work. He saw to see some ourselves the trouble of grinding blindly without knowing how much we take off. This is a good idea. I can not see how we can fail getting good results. All we need is a long stroke at full pressure and with the new arrangement we shall get it. I am quite pleased in solving the problem of keeping the

them out of the chambers of the machine. To give you an idea, sketching on the top part it will look like this:



Note the power on separated in regard dimensions

THE M. S. CONFERENCE

5

6

①

I have been thinking a great deal
about the world and the people in it
and how they are getting on.
The world is a very big place
and there are many people in it
who are not happy. I am not
happy either. I am not
happy because I am not
rich. I am not happy
because I am not
powerful. I am not happy
because I am not
free. I am not happy
because I am not
loved. I am not happy
because I am not
happy.

⑤

⑥

I have a very
happy home.

[illegible]

[Faint handwritten notes, possibly bleed-through from the reverse side.]

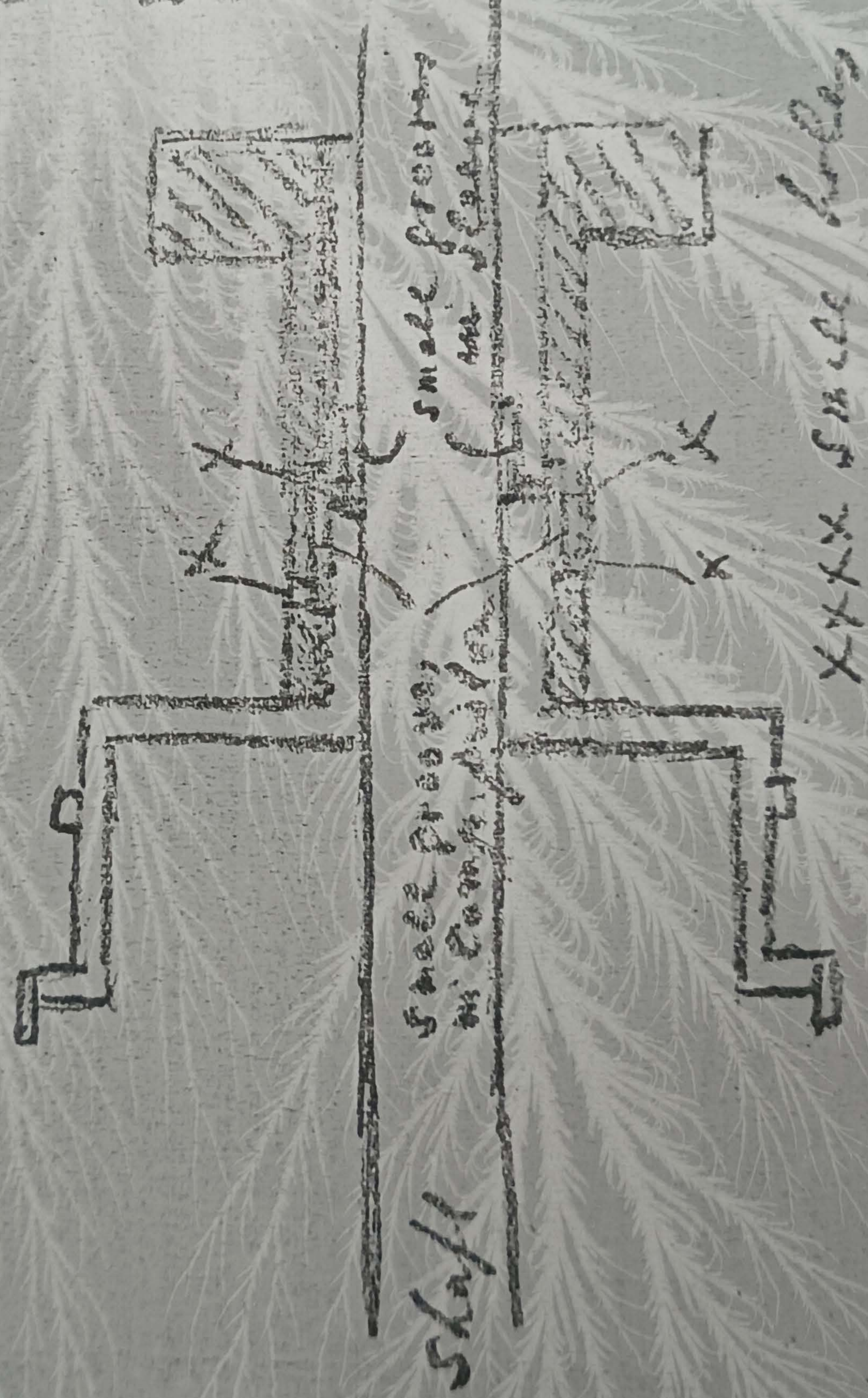
The Waldorf-Astoria New York.

I am sure through which
the air can get in. If
he can find a reason
for this in a large
pipe leading up to the
roof in the roof
in the ground. The com-
mon method of doing
this is to use a
the same can be put
I have known the person
responsible for the
and from the
fine of the so that

⑥

As my heart is more than
perfectly ~~at~~ ⁱⁿ ~~the~~ ^{the} ~~state~~ ^{of}
the same ~~to~~ ^{to} ~~save~~ ^{you}
ourselves the trouble of
proceeding blindly without
knowing how much we take
off. This is a good idea.
I can see ~~that~~ ^{how} we
can find following good results.
We have been in a long
struggle at false premises
and with the new approach
I think you will feel it.
I am quite pleased in solving
the problem of regaining the

from and the...
... To give
... blanketing
... here it will
... like this:



Not the power on...
as regards the...
...

I have been thinking of you very much lately
 and wondering how you are getting on. I hope
 you are well and happy. I have been very busy
 lately but I will try to write to you more often.
 I have been thinking of you very much lately
 and wondering how you are getting on. I hope
 you are well and happy. I have been very busy
 lately but I will try to write to you more often.
 I have been thinking of you very much lately
 and wondering how you are getting on. I hope
 you are well and happy. I have been very busy
 lately but I will try to write to you more often.

Shake, but I do not believe that as they are now they contribute much to the strength of any, being weak and through in the places where the screws are located. We shall of course leave this improvement for the last to be the main side by the whole, it can be easily overcome. In the next tests I propose to connect the two sets of 600 tubes in a parallel reservoir, having an opening

The Waldorf-Astoria
New York.

June 11, 1904.

Dear Mr. Schenck

Respectfully I have to
 send you the paper I have
 returned for the Reg. It would
 have done me much good. But
 after all our efforts we have
 not been able to get it there
 and there can be no possibility of
 its ever being there - But I might
 have occasion to congratulate
 you for procuring it in this
 way.

I shall see that all along

As you will see their arrangement will make the compressor chamber entirely independent of the steam chamber, as a region of the steam distribution flow will be connected to the intake air. If any steam escapes along the shaft it will go out into the room & not into the compressor chamber. This is a very good scheme. I was almost despaired before I hit upon it. We can best cool the compressors and the bore, the ball bearings. I wish a long stroke and few turns of lower in Douglas Finney Saturday June 10. Not bad but I would prefer to try not send anything during the Ten hours.

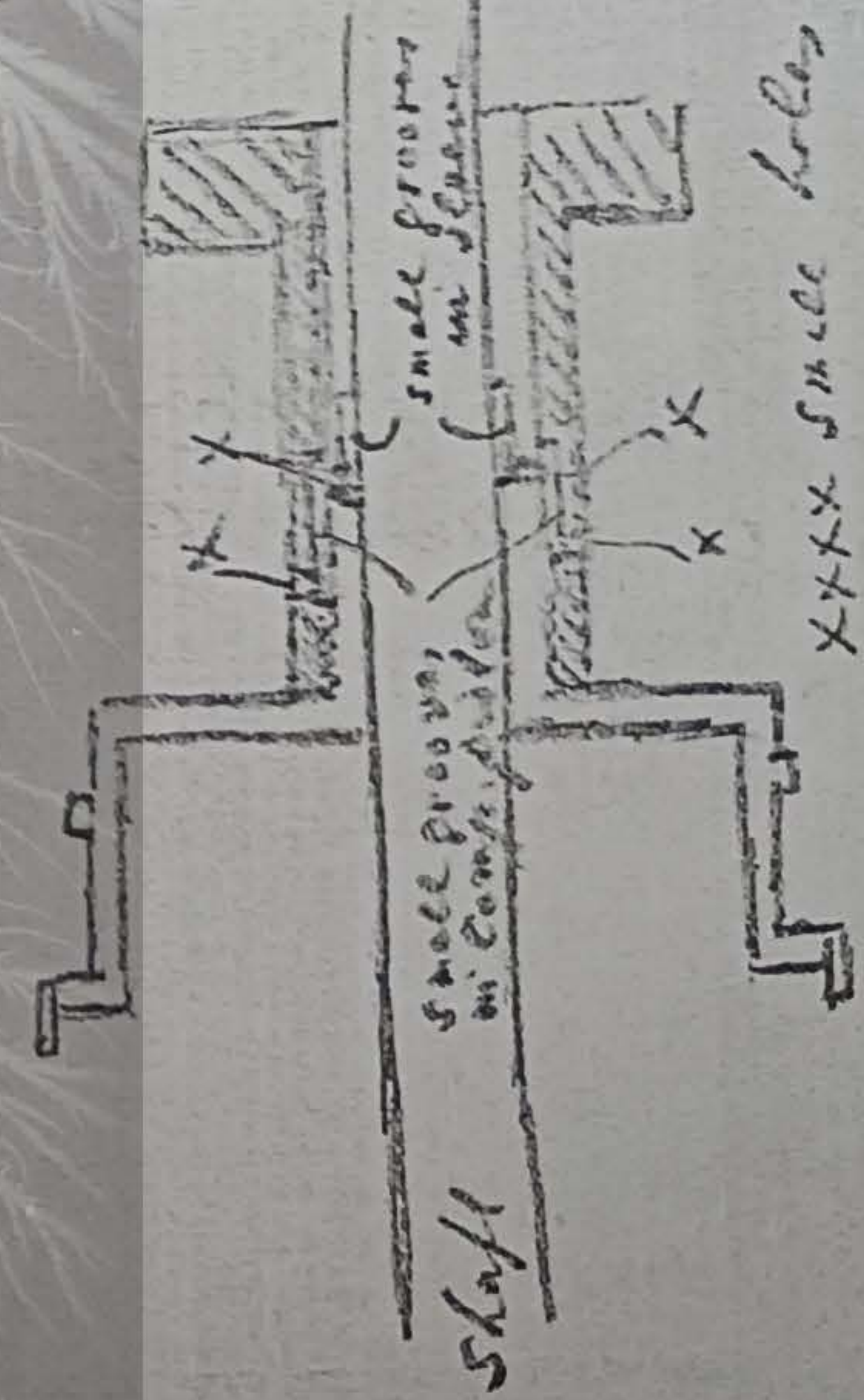
The Waldorf-Astoria
New York.

New York.
 I am where through which
 the air can feel in. It
 is as if the air in the
 room were in a large
 pipe leading up to the
 roof or simply out
 on the ground. The con-
 pression outside makes every
 amount of air a breeze.
 The wind can be great.
 I shall have the pressure
 regulated so that the
 air will be as strong as
 I want it to be so that

The machine is completed. I believe
that we have only seen
the sheet wings high
enough so that the outer
ones shall ~~be~~ ^{be} ~~seen~~ ^{seen}
low for we shall be by ~~the~~ ^{and} ~~of~~ ^{of} them. It is
a good thing. I am not getting in and out
of the machine to long. It is impossible for
to explain, the best way is the sound. It seems as
though the pressure of the thoracic ring should work
them for getting into them. The wings must higher.
compress chambers. If you it will be in
the same way. I have seen recovery
of the two thickens-
is a bit but the different wings over the ends of
the machine. The motion of

We may have a very pleasant job, and also
 the same to some save ourselves the trouble of
 working blindly without looking like this:
 knowing how much we take off. This is a good idea.
 I can see how we can find getting good results.
 All we need is a big stroke of force pressure
 to suit the new machine. I am quite pleased in solving
 the problem of deeping the

Note The grooves are staggered



As for the poems are expected
as regard dimension,

I shall have nothing to
 do except to write
 I fix the stage as before
 I to drill 8 small
 holes in the composition.
 Please you have there.
 I have instructed the Peo-
 ple to capture all
 stages progress as soon
 as ready. I will come out at once
 To-morrow I intend to
 go to Brooklyn to see
 the case people. I hope
 that by capturing situation

The Waldorf-Astoria
 New York.

June 14, 1905-

My dear Mr. Scherff,
 You must be a "tower
 of strength" in financial
 matters, particularly
 in the matter of the
 "Tower of Strength" but
 I shall be glad to see
 you at the Waldorf-Astoria
 at 10 o'clock tomorrow
 I am very truly
 yours,
 J. P. Morgan

He was very sorry but
 could not see an opportunity
 until next week.
 I am sure that
 the other day I
 regret that I can not
 all you go away about
 business. It seems the
 upon getting into go things
 so little experience.
 I am much alarmed at
 the frauds that are popping
 out everywhere, even in the
 highest circles. No wonder
 people do not believe in my
 wireless promises!
 Yours to Father

The Waldorf-Astoria
 New York.

They ought to allow
 to send more material
 long as you go for
 business. At
 any rate I have telephoned
 today that I will be
 in the morning. This
 is the only point of
 view for present. I shall
 be in New York. I
 feel difficult

The Waldorf-Astoria
New York.

June 14, 1905

My dear Mr. Scherff,

You have been a "Tower

of strength" in the

business, and

the whole world

knows it, but

the Scherffs are

as strong as the

Rock.

I am, very truly,

Yours,

John D. Rockefeller

The Waldorf-Astoria
New York.

[illegible]

probably only The best connection from
leave of an and added up and
and we are well along and the
less we have along and the
both when we are ready. I
can make the whole thing
mean. The whole will be
the explanation of the matter. There
is a little more to be
carried by some things. The
whole thing will be
all filled by the same
There being as much as
is usually but some
of the same.

The Waldorf-Astoria
New York.

My dear Mr. [illegible]
I have the honor to acknowledge
the receipt of your letter of the
[illegible] inst. and in reply to
inform you that the same has
been forwarded to the proper
authorities for their consideration.
I am, Sir, very respectfully,
Your obedient servant,
[illegible]

St. Louis, Mo. Sunday, Dec. 10, 1894

I have seen the St. Louis
Public Library, and the
L. A. C. and the L. A. C.

and the L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.

The L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.

The L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.
and the L. A. C. and the L. A. C.

Whitening, such as I have

But I have been with
but later I spent
during as last
Robin is a little fat
and I expect that he
will be very fat
The I am a little
fat in the stomach
by the way I shall
feel a little better
and I shall be
able to go on
the journey
greater than ever
before I have
I shall be a little
better

The local people I hope
Not by explanation of the
value of

He was very sorry but
could not see the
early next week.

Lowenstein's letter
made me very sad. I
regret - that I am
all a day. I am
at home. It seems
very much like a
broken promise.

I am much alarmed at
the frauds which are popping
out everywhere, even the
Lipson's records. The records
people do not believe in by
corroboration. I
am sure of this.

freely could
quite correct them.

The position of the
very well with the
improvements. Then we had to do

Can find for them. I hope we
can find for them. I hope we

hope it is a good thing. I hope it is a good thing. I hope it is a good thing.

of the first of the
of the first of the
of the first of the

of the first of the
of the first of the
of the first of the

of the first of the
of the first of the
of the first of the

The Waldorf Astoria
New York.

June 15, 1905

My
letter
with the
receipts
at the

the basis
of receipt
of receipt

The Waldorf-Astoria
New York.

June 10, 1907

Dear Dr. Schuyler

I hope that you

will be taking a

trip to the south in

midwinter. I would like

to see you at that

time. I have been

in the south for some

time. I have been

very much interested

[illegible]

[illegible]

freely come I am
quite certain that
the machine
very well
improvements. Now we just
can find further. It
can only be
done in the
house should
be of the first
importance
delaying it is
a

Very
Yours

Wm. L. Garrison
of New York

for me. I shall
mean. But I shall
come Sunday.

The Waldorf Astoria
New York.

June 23 1900

That was an awful
night. It didn't
me. I was
Hoping for better on
the next day. I have
been yours. Let it
be safer. I have
felt some coal (1 1/2 t)
to move and
put Peter in paper.

ring a lot of them one of them cushion-
for padding. These heavy rings. So not slip
have desired a better 2nd fl. shape and
feels! After in the short you find some
both print the paper this damaged please
liegen. I prepare everything so

I expect that you shall be able to find
some more of the work

like I have to put quickly.
by the way again. I shall be very
fully. However, say if I am coming out
right of near. It is known. I should
seem to be that then you not hear
is some trouble in the

The Waldorf-Astoria
New York.

Jan 23 1900

Rev. Mr. Schuyler

Dear Sir,

105

on check for \$1000, which
I have drawn on your card
your letter is not received
to me from this week
he is safe.

Have to be
fired on oval (1 1/2 ft)
to mortar and
put Peter in position

let of and one of the customers
These beads rings. do not sleep
a better 2nd the sleep as
in the short you find some
at the Temple Ring damage please
prepare everything so
that you that we can fi-
nally with the work

I am yours truly
care I shall be right
to say if I am coming out
near. It is known. I should
that there you are here

for me. Please let
me know when I should

come Sunday.

That was an awful
night. It drizzled & blew
me away.

Hoping for best on Chicago

the next time.

Love
Yours

W. F. Cook

have sent
let it
be safer
than
I must
your best

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS, "BOLDT, PHILADELPHIA"

THE WALDORF
THE WALDORF-ASTORIA, NEW YORK.
HOTEL MELEVILLE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA
GEO. C. BOLDT, PRES.

THE ASTORIA

The Waldorf-Astoria.

Fifth Avenue, Third and Third Streets
and Motor Court.

New York June 26 1901

My dear Dr. Scherz

I have come to the conclusion that
there is but one best way to make
the American people understand
the American situation. I have
considered French, German, Italian,
and all the other languages, but
I have found that the only possible
method is to write in English.
I was able to find out
the best method of writing
when you know the things of
the world very carefully and
thoroughly. If the same is
not the case, it is not right.

published in Concord paper. I
am perfectly convinced that we can
not expect the members of the
the public school before the war.
Some of the fraternal relations between
an independent government we shall be
to run some kind of business freely.
The only practical suggestion which
I am able to see in this document
is regard to the work of the night
but the young school the was the
which can to prepare plans of
work. I was the board and as a
plan in the board room. You can
select the board and be cal up.
The work for providing by executive for
is for this morning was 45 the same.
although Erasmus for the plans of work
I and all drafts.

Erasmus
New York

The Waldorf-Astoria
New York.

June 28 1905

Dear Mr. Sedgwick,

I let an interview
with you by post & which
was somewhat encouraging
in regard to your family.
His idea was that he
was going to see whether
he could make a volume in
regarding the history of
the Waldorf-Astoria. He was
very much interested in
the history of the hotel.

The Waldorf-Astoria
New York.

June 24 1907

Dear Dr. Schuyler

I had an interview
with you by way of a check
was somewhat encouraging.
He mentioned his family
his ideas was that he
was better whether
than in the other position as
being the most of his
and not being able to
please himself in the

successful. I have
now met him as
as I go to the hotel
from the. I am
satisfied that he is
willing to have me
but he will have to
be persuaded. He has
as I said him upon
this as a contribution
of a person and not
like my friend J. M.
as he has an old
agreement.
It is in the

Still come and I hope
that you will

After that you know
the days from Monday
to the end of the week

are counted in
the same way as
upon the same day

the same day

not to be

the same day

the same day

the same day

the same day

the same day

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS, BOLOT, PHILADELPHIA



THE WALDORF

THE WALGOLF-ASTORIA, NEW YORK
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

CEO. C. BOLDT, PROP.



THE ASTORIA

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Mayor Court.

New York Aug 2 1905

Dear Dr. Schenck

[illegible]

My dear Mr. [unclear]
I have just received your letter of the 12th inst. and am
glad to hear that you are well. I am
at present in the city and have
not time to write you more fully
but will do so as soon as possible.
I am, dear Sir, very respectfully,
Your obedient servant,
[Signature]

P.S. I have just made an
enquiry of the [unclear] and
found that the [unclear] is
about 4.

Had the real plan
 of development.
 The cable was
 sent me by the
 position. I was
 a friend, who
 of the cable. I
 Please hold the
 view of all cables.
 am anxious to get
 prompt news from you.
 The cable people
 today tonight.

The Waldorf-Astoria
 New York.

July 5, 1905

Mr. Schuyler

I have started in
 about today at the
 Penna. Stop. They will
 allow the cable
 a cable and send
 a message to
 Washington. I have
 a feeling of relief.



Mr. George Schuyler

Wardenclyffe
 L. J.



17th Street, New York
are the only building
of the city. The city
is a very old town
I am at a building
the city is a very
old town. I am at a
building. The city is
a very old town. I
am at a building.

suppose I have
a good scheme
like such but
the only problem
the machine
again put in
order. Also
the
as well
possible. It
has been
certain



Mr. George Scherff
Wardenclyffe
L.I.

The Waldorf-Astoria
New York.

July 5, 1905

Dear Mr. Schenck,

I have started this
even today at the
Pena Shop. They will
alter the pattern
a little and send
it to a store in
Newark. I have
a copy of the pattern

11111

NEW YORK, N.Y.
JUL 5 1905
12-PM

17 on the 1st. The birds
are the best looking
of brown. They are
eaten as long as
the machine is light
in a very short time.
I am still thinking over
the way of getting
my valves with
I have a day or two
left. I prefer the
machine by itself.

have
the same
the
problem
the
in
also
the
usual
It
the
man
the

1000

1000

1000

1000

1000

1000

1000

1000

1000

The following is a copy
of the very simple
I have to receive this
and the other volume
of the information will
be the the decision
will furnish, as to
performance

The Waldorf-Astoria
New York.

Aug 5, 1905

Dear Mr. Schell,
I wrote you a
note in hurry this
morning asking Peter
to deliver it to
you as soon as
possible.

Yours
H. J. ...

It is important for
an early decision

The composite picture is further seen $\frac{1}{4}$ " below
traced with reference to the lower center of
to each other and distribution
to the and walls of the I have no doubt that
chambers, I let appear if you take both
kind of it is then a composite picture of
the lower picture has well been taken in the
occurred above the picture. Now that
the center of oscillation I want to know is
but as for the upper or other words - how
I can see that. It is far from the picture
would seem that there is a great improvement
only shells of the system and various kinds
at the upper corners the and walls of

The Waldorf-Astoria
New York.

Aug 11, 1905

Dear Dr. Schell,

I wrote you a
note in hurry this
morning asking Peter

to deliver my letter

when you are at the
shops.

It is important to
me that this should be

The complete picture is
related with the reference of
to each other and with
to the oscillations of the
chamber, I have given a
series of figures showing
the brown portion has
oscillated above the
low center of oscillation
but as low the upper
I am in doubt. It
must be the same
order relation of the system
as the other component the

to his father's house. I believe
the true nature of
his relations
to the I have no doubt that
if you take notice
that a person is
not a person in the
the matter. You will
I am sure is
in the end a loss.
The fact that the person
in each case is
different. I have
seen the same person

July 5, 1905

Dear Mr. Schuyler,

Please pack up the
pieces of upper
part of upper shell
with bronze sleeve.

I intend to have them
made as soon as
possible. I will
try to get
them done for
you by the middle of
the month. I will
be glad to have
them as soon as
possible.

find the engine ought to be made
to give waterful to get the
vessels.

Do not touch the engine to Pearce
theft but just put it in the

it in the engine engine
at engine engine

all engine engine

I can not engine

I/you can find some engine

one to engine engine

side engine engine

please engine engine

do not think that

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

the engine engine

July 5, 1905

Dear Mr. Schaff

Please pack up the
valves and upper
part of engine shell
with bronze sleeves.

I intend to have the
machine as soon as
possible if I can find
steel. It will do for
storing the machine for
a few days. The
shortest possible time.
When the valves are

give the ^{English} ^{English} ^{English}
to give ^{English} ^{English} ^{English}
vessels.

The ^{English} ^{English} ^{English}
the ^{English} ^{English} ^{English}
it in the ^{English} ^{English} ^{English}
as ^{English} ^{English} ^{English}
place in ^{English} ^{English} ^{English}
I am ^{English} ^{English} ^{English}

I/you can find some ^{English} ^{English} ^{English}
one to ^{English} ^{English} ^{English}
side ^{English} ^{English} ^{English}
please do it ^{English} ^{English} ^{English}
do not ^{English} ^{English} ^{English}

ought to be late in the

to get the job done
as I have

the
Express to Boston

the
I have

the
I have

the
I have

some
will be right

not - English when you see
me. But he has

in full about 1000

in

to cooling the jacket.
 This case reservoir is
 the tube above the
 cylinders as you know.
 Now that I want you
 is to send me a
 pattern of thin film
 or mica showing the
 outline of the box
 on the compressor where
 the suction valves are
 located. It will look
 like this



suction holes

valve
hole,

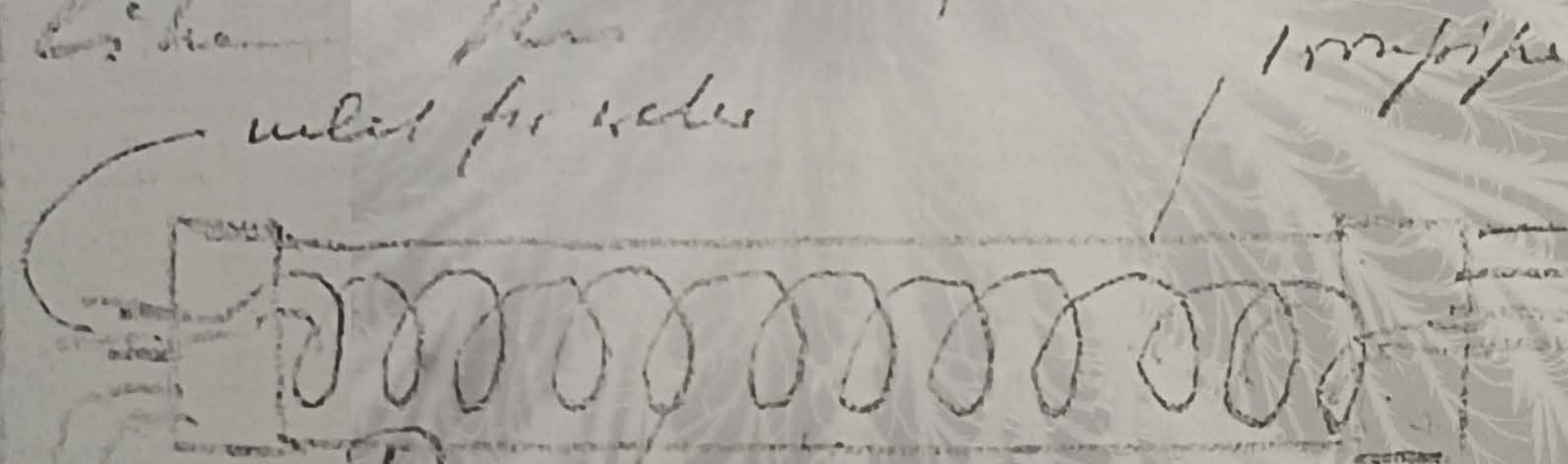
The Waldorf Astoria
New York.

July 6, 1901

Dear Dr. Schuyler,
 I have been to the
 building that the best
 way to get to the
 room for cooling
 the compressor on the
 lower of the
 valves. I prepared.
 I shall have
 Dr.

Anders Construction and
furnish cooling reservoir

Like this
inlet for water



R
reservoir for water

Could be cooled air going to compressor

In this way as you see
we can cool much more
effectively. I am satisfied
that we shall find if
we follow up the scheme
as originally intended. The

air enters in too
fast and cools too
is so quick that
there is no time
for covering with
water. The

cooling of the water
is very slow. You
see. The
air enters the
on the small com-
pressor. Several
they were compelled
to use an extra
reservoir in addition

return, important in the
phase of development:

1) greater performance than other
will provide

2) Suppression of noise
made by suction valves

3) Easy regulation of
floating of the pistons

by adjustment screws passing
through the brass cap to lock the

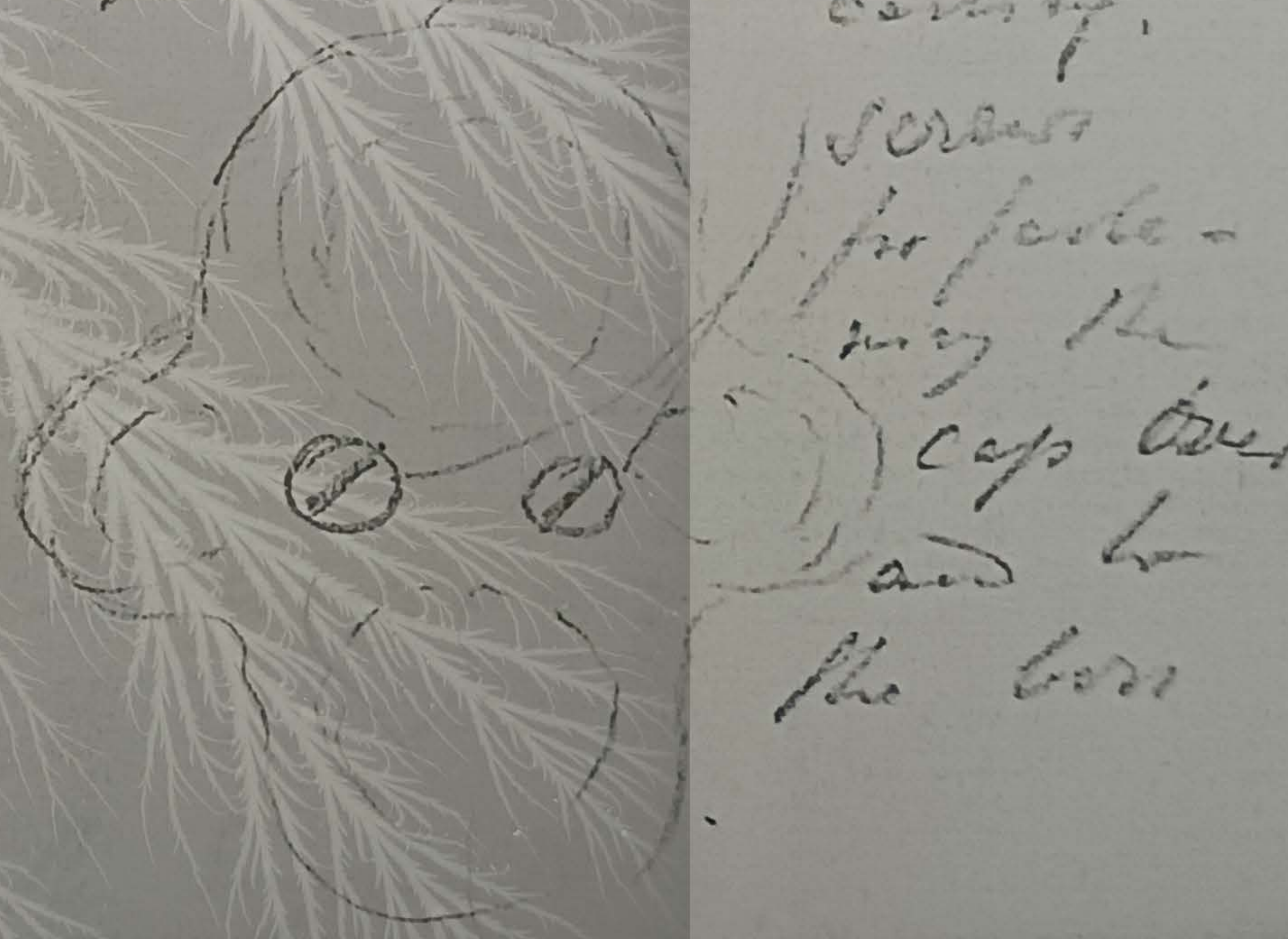
the holes of the suction
valves, thereby allowing one

two of them the section
of the wheel.

As you will see the
caps will be practically

The Waldorf-Astoria
New York.

I shall have a small
piston and two carriages
made which will be
held in place by screws with
the screws over the
valves in the waterhole
when the wheel is
carrying.



Screws
for fasten-
ing the
caps over
and to
the boss

The two front bones will be if necessary
the compressed air will connect
connect with caps in the cooling chamber R
the chamber. The caps at X to take the cold
being hollow the air and coming in through
from the compressing jacket, and deliver it into
into the jacket, the compressing jacket, D
through the water jacket into the chamber through the
the valves. When the valves into the cylinders
The bones on the back from where it will be
found the water will be from where it will be
left as they are and ejected into the compressed
in each of them and are reversed in the
pipe will be secured in corner of the engine room.
all these four pipes, Advantages of very practical

without the engine.

All the rest will be
by difference in the
working of the machine and
I ought not to have any
difficulty in immediately having
any part of the construction
and the of proper material
and other improvements. The
best class of systems with
delay. I can build a plant
with this system for I can
close a deal with one of
the competing companies. They are
fighting over the turbine and
if I can beat the turbine I can
a million more money at once.

The Waldorf-Astoria
New York.

and is forced by suction
but two screws as indicated
will hold them any
way. We may put a
thin packing between the
tops and the box. They
then it will be very
easy to move them if
a little air from the
atmosphere gets in. It
will cool when necessary
with the one that comes
from Reservoir R.

I think that another
valve is ~~needed~~ a
better working of the
suction valves for you
will see that when
one valve is opening
the other is closing.
They see that
air enters other. If a
little air escapes from
the closing valve it
will help to open the
other valve to provide
the air more quickly.

In the present bones
there are holes for
the paper types, he
can drive them out
and make them as
large as we can be
provided large section
for this inlet of air.
This is not much of
a job. All this work
can be done and
preparation for the vacuum
since we are just
the experiment in place

shall it was like to be

I must have a working

shown as soon as possible

for only as can I get

people of education. Truly

the same as the school

and can be made at

the school of the

and can be made at

I shall have to make a

the future as possible

allowance for solidarity

You will have for a

as soon as I have

well. Meanwhile please

write about everything fully

and I shall be

Truly

The Waldorf Astoria
New York.

July 6, 1905.

of all

effort.

I can not understand why

you can not answer

the question, they want

to know

the

the

from such against the together. But we
will
sell up the company by the process will
as to prevent the same from being done
on the end. It would be better to have
perhaps be better. If they get the city
will not I come out, to answer I must
for if we can manage to get them to get
in all the time. If everything
be clear for the time. I shall have
a few minutes. The first of all I shall have
for night from very much. I shall have
trouble on it. I shall have to do this
prefer that we do it. I shall have
to be held a shell.

thru to get me
of course a great
revel.

The Waldorf-Astoria
New York.

July 7. 1901-

Dear Dr. Scherff,

I do not know whether
the sleeve has been
injured by some change
in the position of the
line. The shaft
would seem to be
all right.

Please have the
lower
any more to compress
both up and
down to be sure.

Have some prospects
for to-day in the hope of
making a few
at least

They must be at
least as good as

possible
Thank you have

found it impossible which has to stand
be ~~in the way of~~ a good share
pieces never sold, ~~which~~ As the
Have only everything in with him
ripped off a few bottles. I expect
I shall have them in upper
part things, more shall be
the lower ring off safe for a good
at balance. The whole with some
leaving off the little changes on
rings in case the shaft I can
make the end look just a layer

The Waldorf-Astoria
New York.

July 7, 1901

Dear Dr. Scherff,

Please have the

list of names

any one who has

been

in the

They were

There are

possible

about you have

Count it impossible
to understand the

pieces. However, I

Have not everything in
tips off a form.

I shall have the

h.c. things, some

the lower way off

at balance. The

leaving all the

steps in common

under the solid

which has been stored
a great quantity
richer. As the
iron with human
bodies. I expect
the the upper
there will be
safe for a good
while but some
little things are
the shaft I can
get a layer

shot & Pel was
y course on ground
reached.

I do not know what
the reason for coming
up to the ship
that night was
home. The ship
was down to the
all night.
I have some prospects
for to-day in the hope of
making a
small
addition

The Waldorf-Astoria
New York.

July 1st 1891

Dear Dr. Schuyler

Dear Sir,

I have just

received from P. H. Schuyler a copy of your
report on the subject of the

I can not understand why

you could not measure

the position, they are

together and are

might find them

perhaps should against the latter. I will
sell up the company. I will
and so joined the steam line to finish them
on that end. It would appear I do not know,
perhaps the better. If they get the city
will will I come out, I know I must
for if we can never expect them to get
in all. If everything
be able to do it. If everything
a few minutes. The good will I shall have
for right from very out immediately.
trouble as I said I thought that it could
prefer that we do it. I have to adopt this
but to make a deal.

shall it was like to try

I must have a working man

chosen as soon as possible

for my as can I get

people interested. Perhaps

the room was bad and the sea

was casting a gloom over you

and I was in a hurry

~~to write you a long letter~~

I shall have to take a piece

of the paper away from me

a little for solidity. I can

you will have from me just you

as soon as I have come the

result. I should like to see you

with about everything full. I might

from all the

from all the

The Waldorf-Astoria
New York.

July 1, 1892

Dear Mr. Schuyler,

I have been to the
Archives but have not

yet found the
manuscript

you are looking for.

The manuscript is in the

hands of the

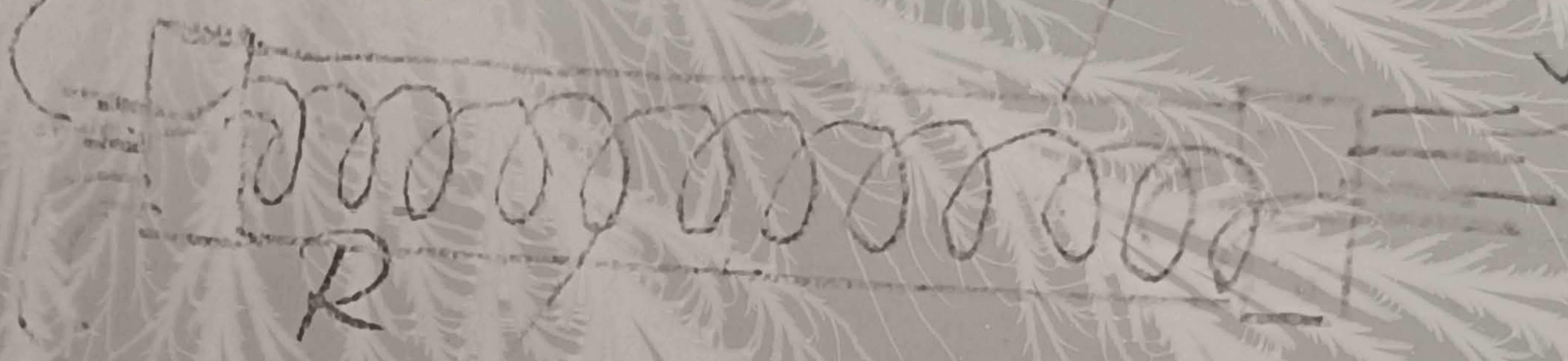
Archives. I proposed

I shall have it.

Anders Construction and
 Furniture Co. 125 Bay View Ave.

Like this
 inlet for water

100 ft pipe



Y inlet
 for air to
 be cooled

R

inlet for water

Could for cooled air going to engine room

In this way as you see
 we can cool much more
 effectively. I am submitting
 for you the plan of
 we follow up the scheme
 as originally intended. The
 inlet for air to be cooled
 on the
 present
 they use
 to use
 reservoir

curves
pipe

are under the
level of the
is so high that

Y
F
F

under there is a line
for air to be cooled for cooling with
water, then

for

capturing of the water

compressor with low pressure for

its use. You

would advise them

on the small engine

from Japan. They

they use compressed

to use an engine

reservoir in addition

Below, is a list of the
stages of development:

1) greater performance than the
normal condition

2) suppression of force
made by suction valves

3) Easy regulation and
floating of the piston

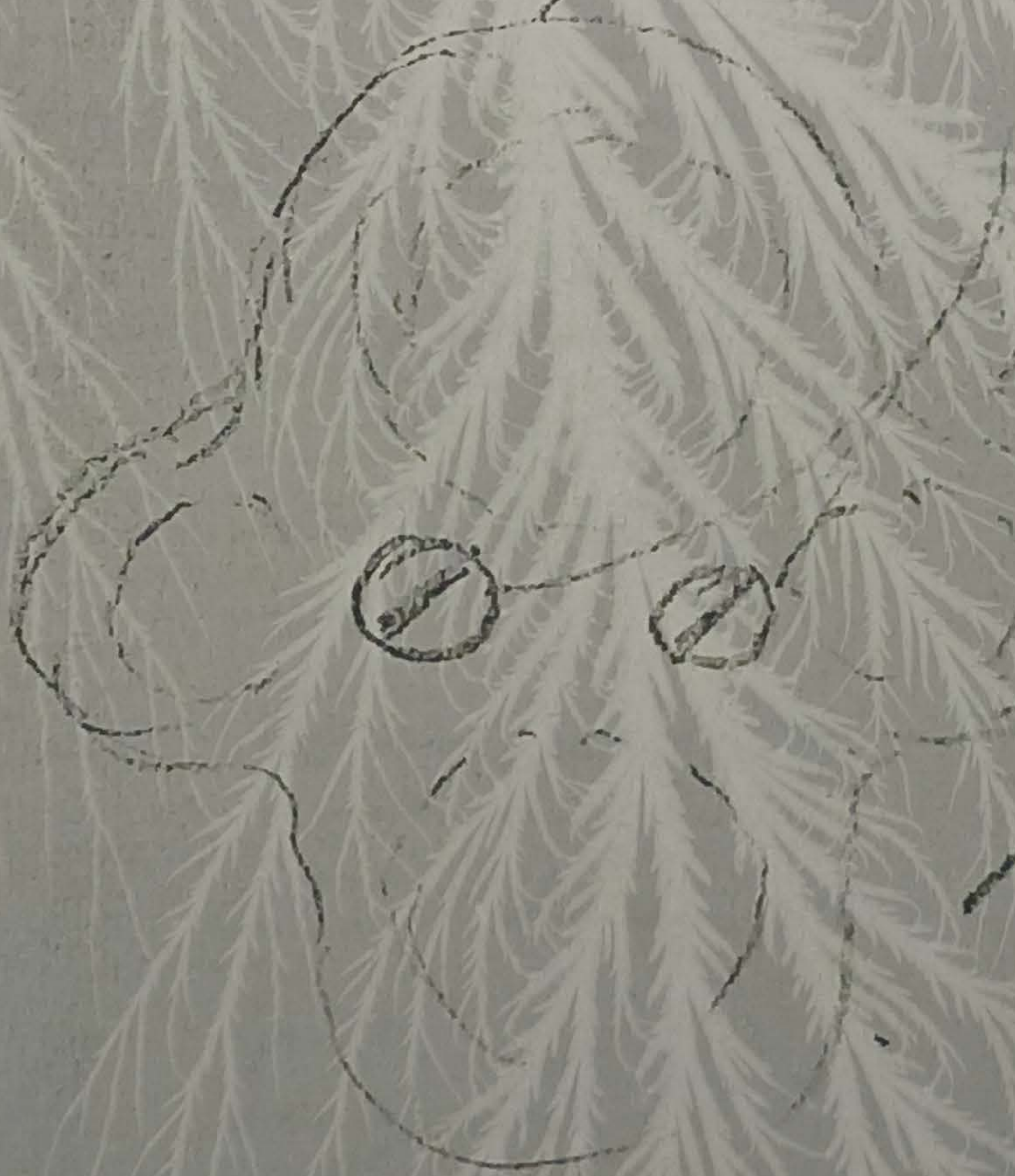
4) Suction valves being
through the brass cap

the holes of the suction
valves, thereby allowing on
top of them the suction
of the water.

As you will see the
cap will be practically

The Malborf Astoria
New York.

I shall have a small
hollow in the center
the hole which will be
filled with
the same over the
water hole
like the hollow tree
centering.



Several
for farther
may be
caps over
and for
the base

The two front bones on
the compound eye will be
connected with the caps on
the humeri. The caps
being hollow the air
from the compound joint
will be able to pass
through the hollow bones and
the valves.

The bones on the back
round the water will be four
less as they are as equal
in each of them as
pipe will be connected
all these four pipes

will be if necessary
united and will connect
in the cooling process. R
at X to take the air
and carry it through
the air delivery of air
the expansion of air
from the through the
valve into the cylinder
from there it will be
as ejected into the compressed
air reservoir in the
corner of the engine room.
Advantages of very practical

The Waldorf-Astoria
New York.

and
had a number of
but how serious
could will hold them
any. We may put
them packing between the
tops and the box they
the in
the do
a bottle of
Santalum oil
will cost when
with the
from
Reservoir R

The Waldorf-Astoria
New York.

held in position by such
but how serious as in
acted will have been any
day. We may put a
thin patching between the
days and the loss. They
then in not having
We do not know of
a little air for the
order get in. It
will cool when midday
with the sun has come
from Reservoir. R.

I think that another day
will give us a
better working of the
suction valves for you
will see that when
our weather say the
suction is opening
the more the more it
closes. They will then
aid each other. If a
little air escapes from
the closing valve it
will help to open the
other valve so forward
the air more quickly. It is

In the present boxes
there are holes from
 $\frac{1}{2}$ " paper tappers, but
can drill them out
and make them as
large as we can be
provided large sections
for them instead of being
This is not much of
a job. All this work
can be done and
the preparation for the boxes was
done so we can put
the contents in place

to cooling the jacket.
 This case resembles
 the tube above
 cylinders as you know
that I want you to see
 as to see how a
 pattern of thin film
 or mica showing the
 outline of the box
 on the compressor where
 the injection valve are
 located. It will look
 like this



The ... of ...
...
...
...

Enclosed

SS

July 5, 1905

...
yesterday.

...

...
life

...

Saw girls in the street. I hope
he would have a different
every body. I hope
people are not so
has been
side.

People people to the
doing all they can to
complete the work. I
think they ought to
to him. I support
during the winter.

MS

July 8 1890

Dear Dr. Schenck

I have just returned from

London and Cambridge

Saw you in the
the same place
every day

When I go to the
the same place
I suppose
that they
I suppose
containing



The Waldorf-Astoria
New York.

July 16, 1905

Dear Mr. Scherff

There was a short
editorial in the
N.Y. Times in which
they took account of
feet upon the
very nice. It was
very circulated. I
can not remember the
date but it was

Should after I published
my first letter in the
Sun will appear in
the Saturday. Will you
please mail it to
me in recognition of
this. You can easily
make a mistake.

Hope you will enjoy
this/yourself matter in
Port Jefferson, also that
the best I shall will
reach Peace & harmony
morning. Loving & True

P.S. - I hope
you will
enjoy the
appearance
of the
Sun in
the morning

The Waldorf-Astoria
New York.

July 10, 1900.

Dear Mr. Schuyler

There is a short
editorial in the
N. Y. Times in which
they call attention to
elections upon the
very rare. It is
very correct. I
can only regret that
data has not been

Should after I published
my first letter to the
Sun will inform to
the Saturday. Will you
please mail it to
me on receipt of
this. You can send
them a draft also.
Hope you will enjoy
revisiting matters in
our Jefferson. Also that
the best of style will
reach Pierce & home
many. Lovingly to both

brother

then

to

and

the

P. S. I have not yet
seen the picture of
the man who was
killed in the
attack on the
house at the
end of the
road.



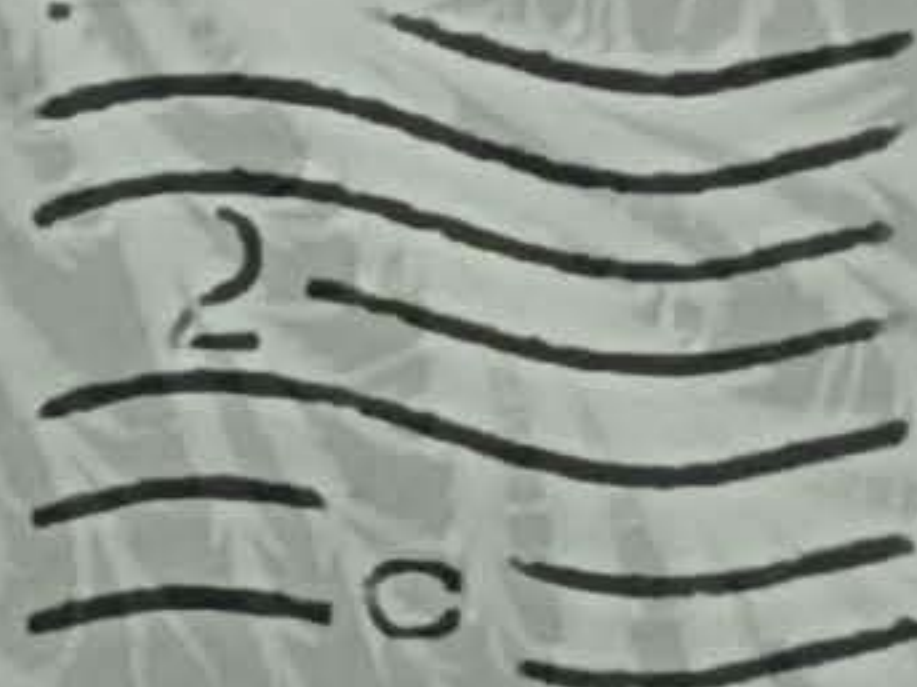
problem to solve. No.
of the kind is to
send by Thelma
pencil on "Indivi-
dualism". I am
afraid it will go
up in a storm! If
it does I would be
very sorry. It is exte-
mely valuable. In two
or three years it would
bring a fortune.
Will let you know when
I am coming.
Sincerely,
L. J.

The Waldorf-Astoria
New York.

July 12 1901.

Dear Mr. Scherff,

As I have already told
you in a previous letter
mailed this morning the
work will not be finished
before Saturday. At best
I can begin to take the
pencil out on the after-
noon train. Should all
be complete by Friday
evening I would come

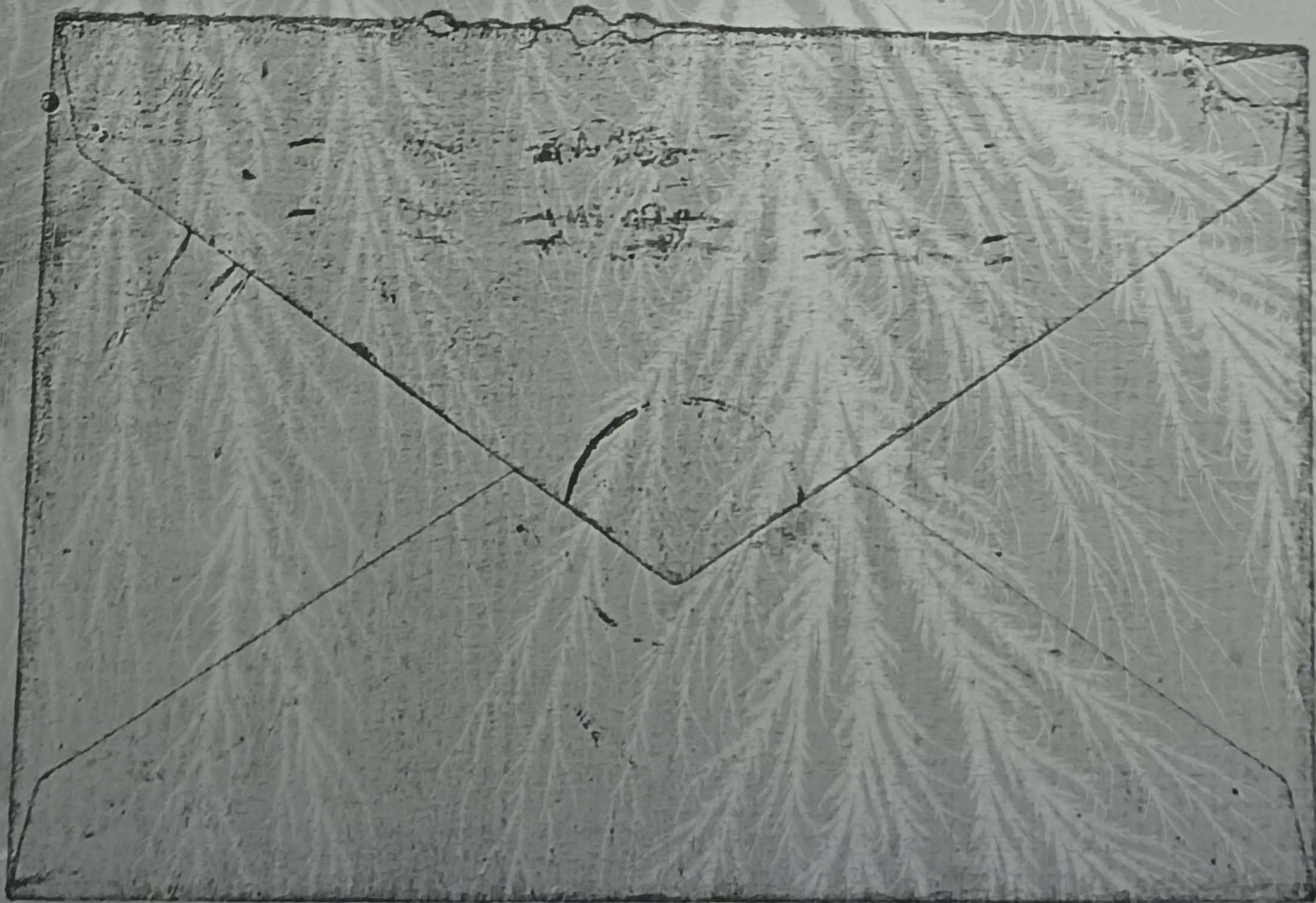


Mr. George Scherff

Wardencliffe

L. J.

Saturday morning.
The letter when I saw him for the evening
to day did not seem if he does not make
to him the slightest part his present promise.
doubt about planning. I have been all in
a small interest. So medicine so that we
must so that he can make the best
and in a week, then as quickly as possible.
his party will return I am expecting exact
to the city, he would best results and I
send me the check. I believe there is
I believe there is can secretly tell you
the future he will how badly I need them.
from a valuable person I am sure
I have a number of





Mr. George Schuyler

Walden City Pa

A. S.

The Waldorf-Astoria
New York.

July 12 1901.

Dear Mr. Schutt,

As I have already told
you in a previous letter
I received this morning the
work order and have finished
it before Saturday. As soon
as I can I will be taken there
partly out on the after-
noon train. I have all
the outfit for Friday
evening I would come

Saturday morning.

The school when I saw

the day should not see

to have the stippled

about about pleasing

a small interior, to

there for the line

and in week, when

the hang with where

the ing, the would

about the cheer,

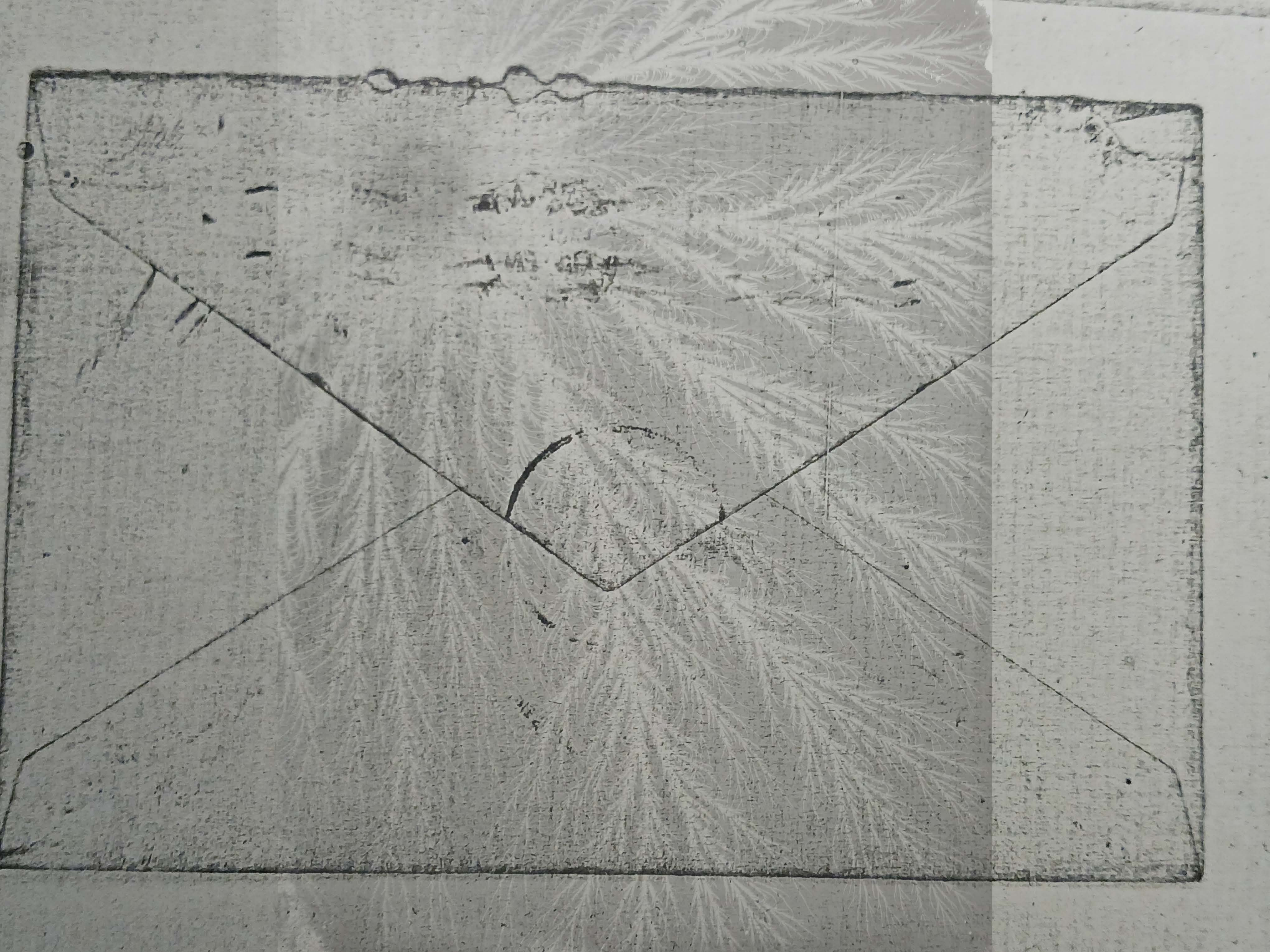
I like over there in

the future he would

from a vehicle

him for the evening
 if he does not return
 with his present promise.
 Please him all in
 week's time so that we
 can return the best
 as quickly as possible.
 I am expecting excellent
 results and I
 can scarcely tell you
 how badly I need them.
 Before I am out
 I have a number of

brother to solve the
of the land is to
send my brother
painted on "Indian-
structure". I am
afraid it will go
up in a flash, I
am sure. I would be
very sorry. I am
not valuable. I have
a few years of work
before me. I can
bring a fortune.
Will let you know when
I am coming.
Sincerely,
at Perth



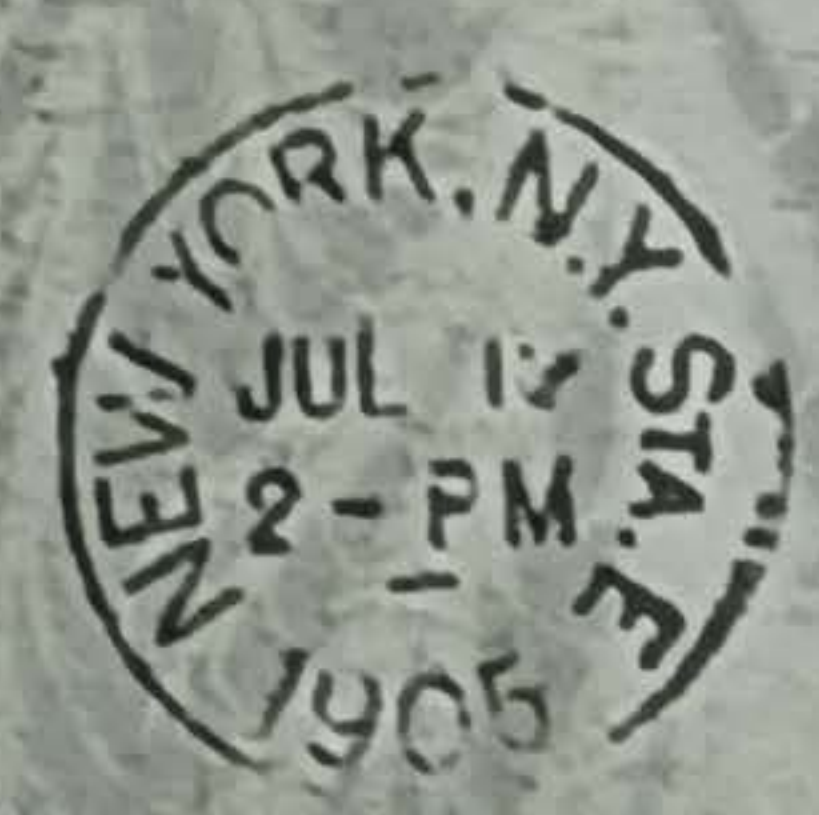
one/some people I say
 have to get out L-morning
 Have you succeeded in getting
 somebody to cut the
 grass? What about the
 Rionthel matter? On
 the top of all my troubles
 here there of Wardenlyffe
 are like weights added
 to what I cannot put
 about carry
 Do not forget the word
 which will enable us to
 make a quick start.
 The Selton matter is progressing.
 He may be able to place an
 interest some thought nothing has
 developed as yet. Sincerely L. J.

P.S. I do not think that
 I can get a pass from R.R. Co.
 for the 3rd one.
 The Waldorf-Astoria seems to
 New York. he delivers few.

July 12 1905

Dear Mr. Scherff,

Note of your letter
 have been received and
 are welcome. I am
 glad you have been able
 to come L a schiffe-
 by not outcading in
 R. P. I. matter. As to
 the coal supply we are
 out doing the Abderites



Mr. George Scherff

Wardenlyffe

L. J.

There seems to be nothing else left. You are doing well. The foreman contracts the same people here. I

The dearest piece is an effort we can not finish yesterday and we expect to be the are now at the cushion together again and the drip in the before Schorley. As slept. But it will soon as everything is like now to be finished I shall come see the I thought of one. There is surely first. The valves are an advantage to be being fixed by another second by my enemy than but more than our corner but can has come to be an account of the contract kept on account of watching with the



I am P.S.
morning I do not think that
I can get a pass from
the N.Y. R.R. Co.
The Waldorf-Astoria Hotel seems to
New York. He knows few.

July 12 1901

Dear Mr. Scherff,

Both of your letters
have been received and
are welcome. I am
glad you have been able
to come to a decision
by understanding
the P. 9 matter. As to
the coal supply we are
out during the Abderites

then seems to be
nothing else left. You
are doing well.

The dearest piece is expected
from the yesterday and we
are now at the cushion before
and the drop in the
steps. But it will soon
take more time to finish than
we than I thought at
first. The valves are
being fixed by another
man but more than
has cost 200 lbs. and
fixed on account of

to be a pressing contracts than
You have people here. I
an afraid we can not
ice to expect to have the
and we must be together again
cushion before Saturday. As
in the room as everything is
to print finished I shall come
all at once. There is scarcely
an advantage to be
another second by my coming
than and sooner but on
account of the contract
and my understanding with the

our standing people I say
but he got out 6-morning

P.S. I do not
I can see

Have you succeeded in getting
somebody to cut the

grass? What about the

Riverbank matter? On

Dear

the top of all my troubles

Now

here there are some people

him

are like myrtle and dad

now

to what I cannot put

that

about carrying

do not forget the wood

which will enable us to

make a quick start

The school matter is progressing

He says he will be pleased to

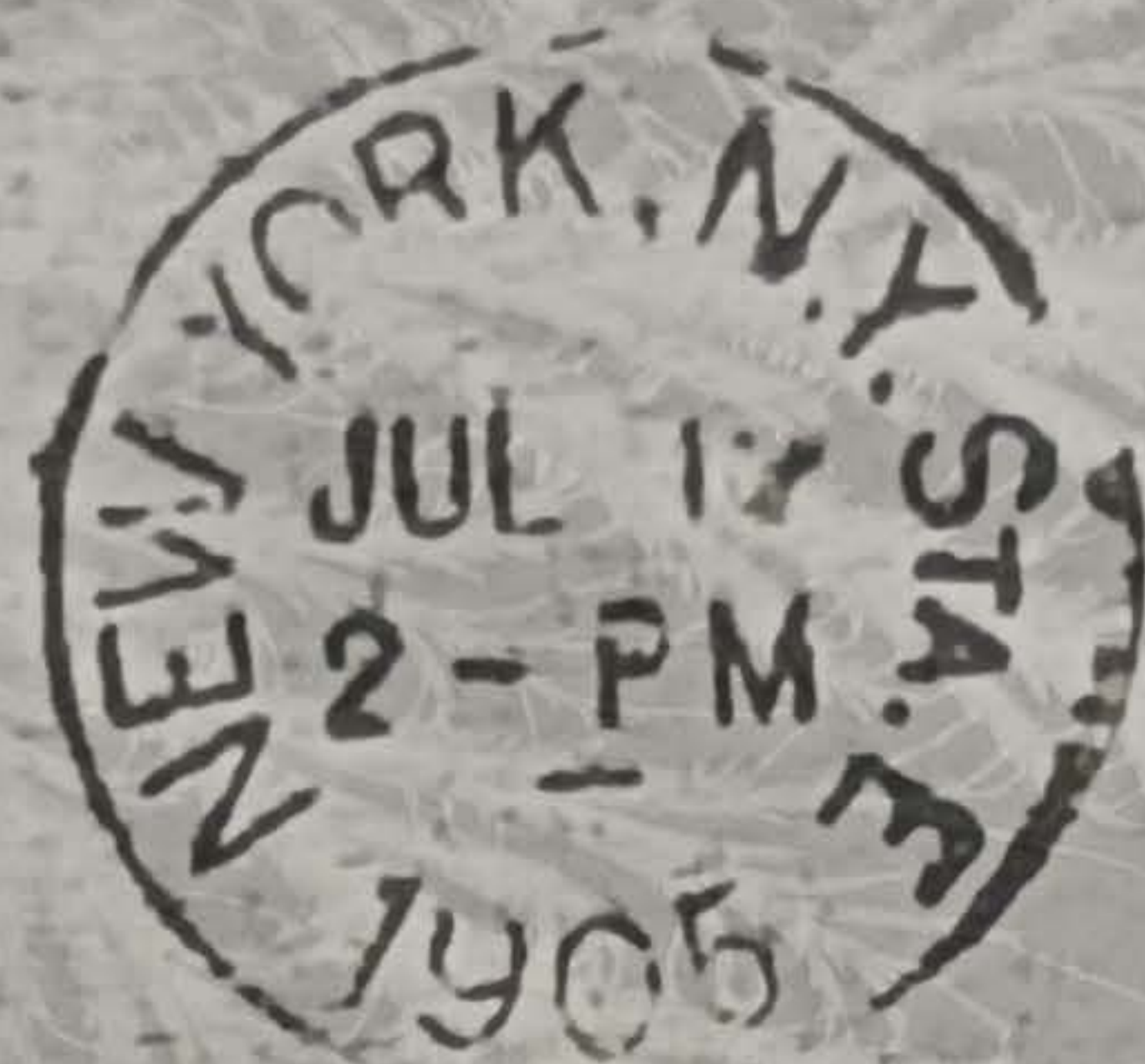
interview some though nothing has

developed as yet. Sincerely at Tuck

R. P.

The coa

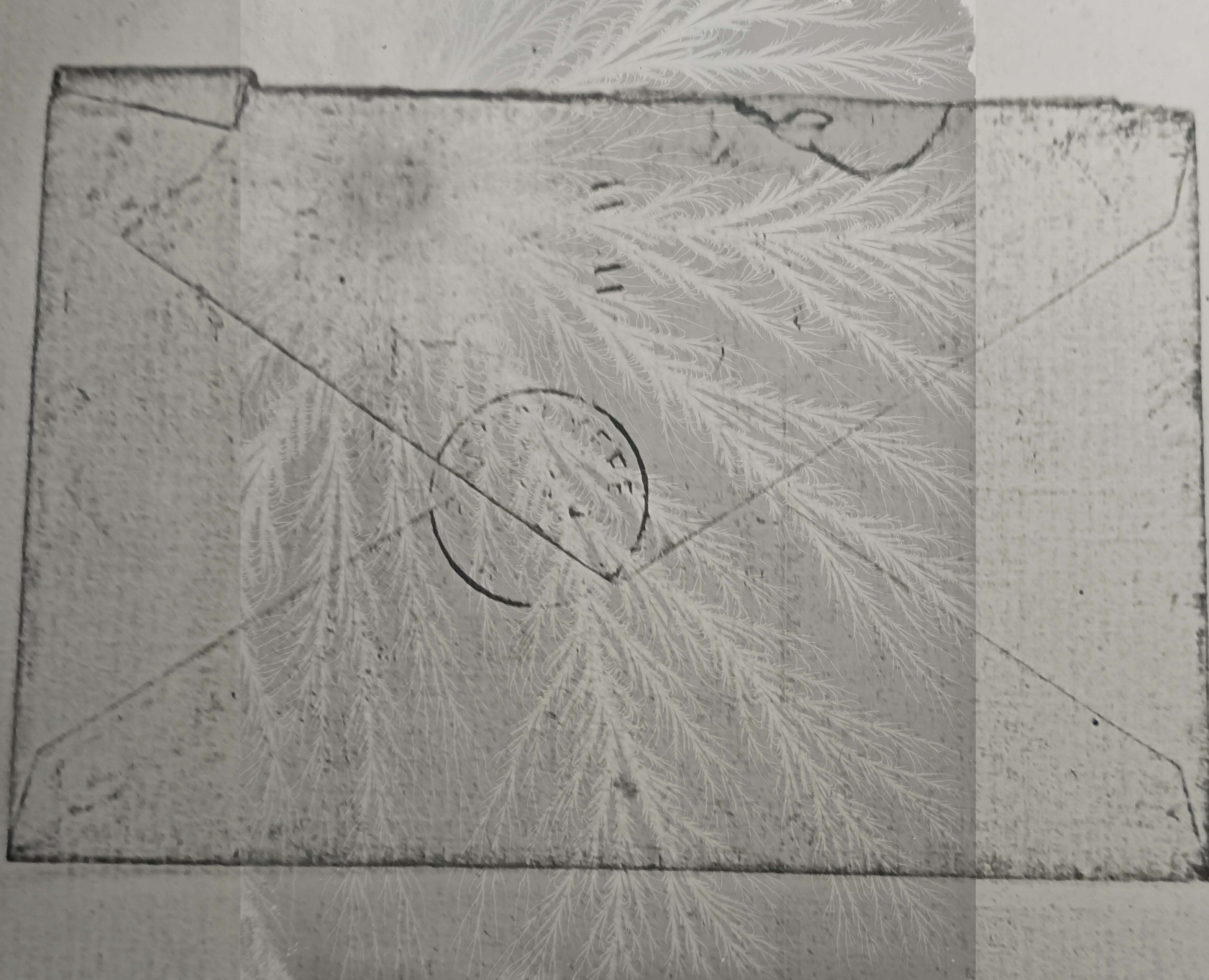
out doing



Mr. George Scherff

Wardenclyffe

L. S.



NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BOLDT, PHILADELPHIA"



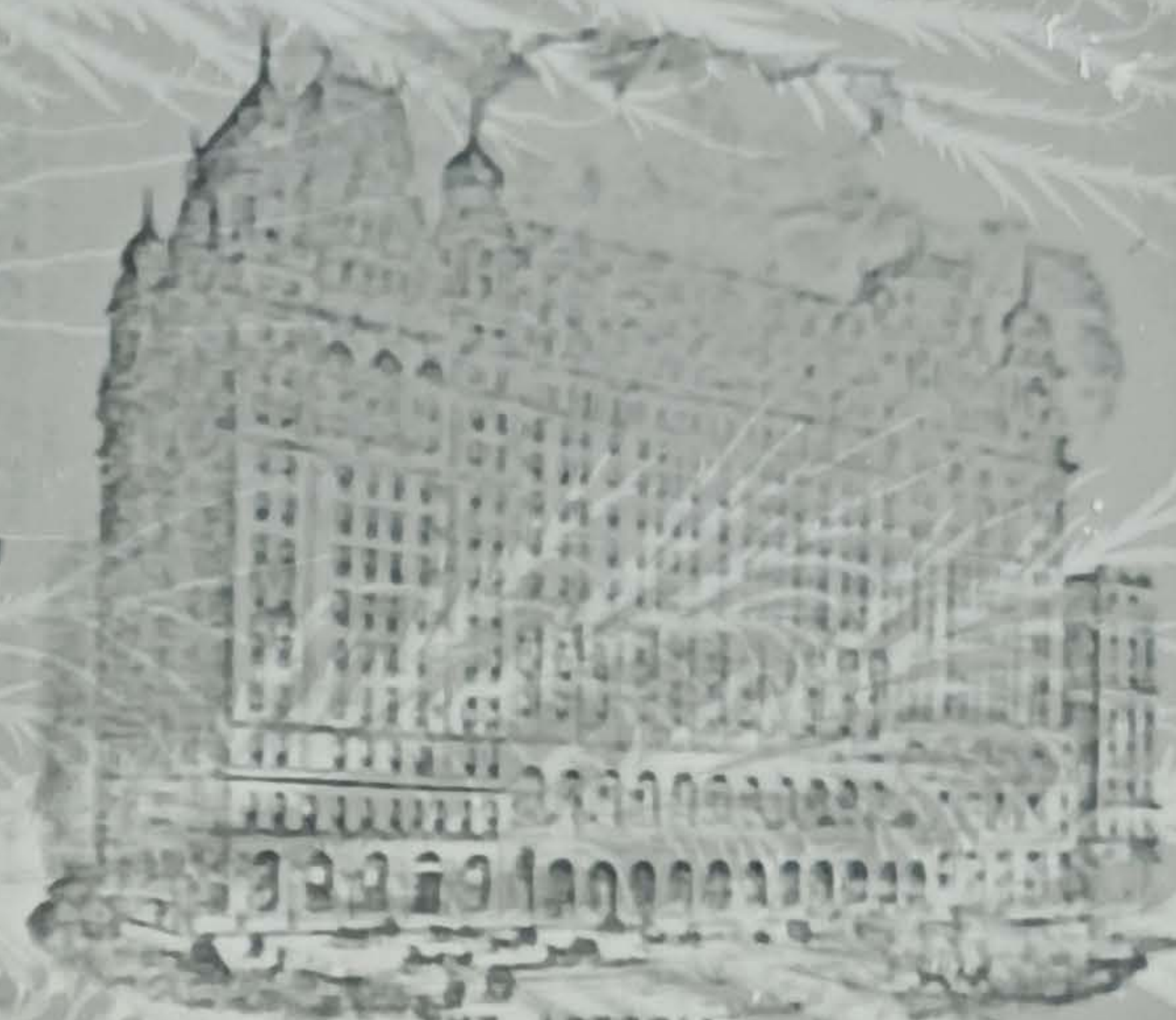
THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEORGE C. BOLDT, PROP.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York July 20 1905

Dear Mr. Schorff,

The valves have just been delivered
to me and I expect to come out to-
morrow to return the day following.
I have ordered 8 extra steel washers with
a little thicker bottom plate as one
of the last was broken. These will be
furnished as soon as possible. In the
new valves the improvements I explained
to you have been carried out and a
pin has been put through each cap to
prevent accidents of the kind we have
had with before and will not happen again.
The action of the new steel washers seems

to be very good and I hope for much
much better than the last obtained.
Your letter indicates me greatly. I was
already beginning to fear that something had
taken place and of course I expected the worst.

I will tell you frankly that it looks
doubtful for this resolution unless Tolson carries
and his promise for the 22^d. I
have several chances and many hopes but
I have been disappointed so often that I
am now in a pessimistic mood. Just as we
have seen the situation is in a precarious
form by the stock market will soon up. I
am positive that the world of them
that will be greatly satisfied and
the situation must be better.

Sincerely

W. T. Ford

justify ourselves, that it
works well. It will not
be necessary to stay up
late. I would prefer to
start a little earlier on
Sunday and keep the machine
running with about 80 lbs.
Later we can raise the

~~pressure as high as~~
we find possible.
I anticipate this letter
will reach you at
noon to-morrow, so you
will have ample time
to prepare.

Sincerely,
A. T. T.

SS July 21. 1905.

Dear Mr. Schaff,

I saw Mr. Tolson today
and he informed me as
concerning the interest of
which I spoke to you
already placed. That is
to say he accepts it as
a fact that his friends will
do what he says without
a question. This you can
trust. Love the cord and

With the collection will be about noon. There
be materially improved, how better will be made.
This however is not my more reliable as I wrote
only expectation. I have already, as I would like
conferred with Mr. Andrews to have them in the valley
for his coming out Sunday, in place of the old which
I shall myself be there on his visit at my
home, Saturday evening, have been shown how
it is impracticable for me to meet in the last case,
to leave in the morning. Please have them at
my end be too long to leave when the train
explains in a letter. But arrives. We have not
one reason I need mention much to do at after
his and that is that there is a little bit we can
that rather will be delivered that the measure and

W

July 21. 1905.

Dear Mr. Schuff,

I saw Mr. Schuff today
and he impressed me as
considering the interest of
what I spoke to you
already placed. That is
to say he accepts it as
a fact that his friends will
do what he says without
a question. This you can
much love the card sent

With the relation will
be materially improved.
This however is not my
only expectation. I have
conferred with the Indians
for his coming on Sunday. I
shall myself be there
to-morrow, Saturday evening.
It is impracticable for me
to leave in the morning. Pl
My word to his boy to
explain in a letter. But as
one reason I need mention
his and that is that the new
steel vessels will be delivered

to be about noon. These
new books will be much
more reliable as I note
already, as I would like
to have them in the volumes
in place of the old which
are too weak & they
have been shown how
much in the last last.
Please have them at
least when the train
arrives. We have not
much to do at after
a little while we can
start the machine and

trying ourselves that it
works well. It will be
a necessity to stay up
late. I would prefer to
start a little earlier on
Sunday and keep the machine
running with about 80 lbs.
later we can raise the

~~pressure~~ ~~to 100 lbs.~~

we find possible.
I am afraid this letter
will reach you at
last to-morrow, so you
will have ample time
to prepare.

Truly
yours
A. T. A.

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE PHILADELPHIA"

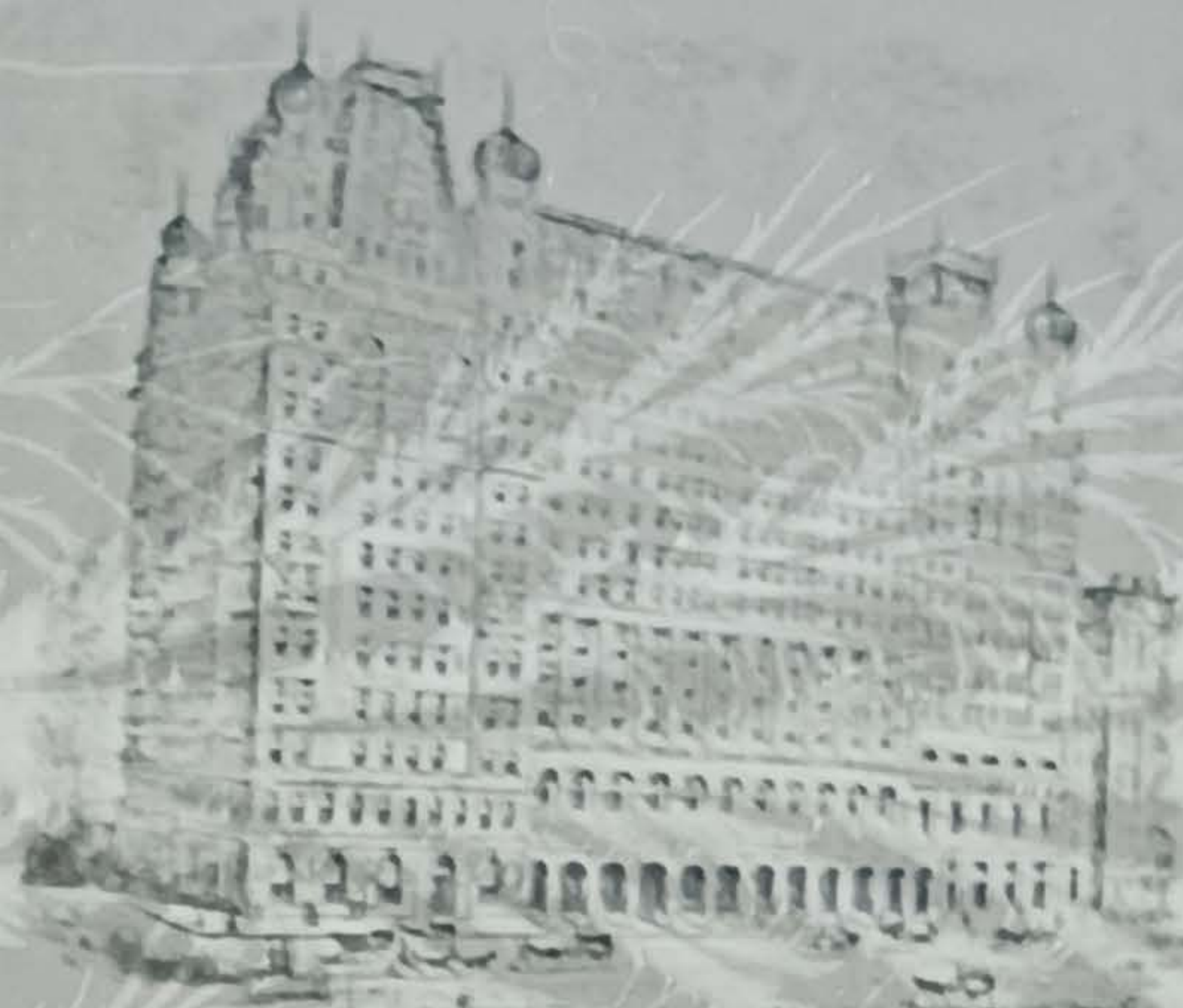


THE WALDORF

THE WALDORF-ASTORIA, NEW YORK
THE BELLEVUE-STRATFORD, PHILADELPHIA



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

Dear Mr. Schaff,

New York July 21 1905

I had prepared to take the train this morning but in the last moment several reasons prevented and I decided that it would be preferable to delay something here today as some one has - known Mr. Andrews I expect will be here Sunday.

In the first place I wanted to have the new photographs with me as I am afraid that the last ones have been very much faded on account of the caps increasing showing them best. I forgot one of the black and white. The new ones

will be even so much safer. Then again
I thought that in the event we do not
have any more birds we might get along with
the store of corn which is being made
about last November evening at the store
again at say 10 A.M. Sunday.

I let a man be telegraphed change of
plan this morning but I thought that
as you propose in the first letter
to come with you probably with you
start the first, as steam can be
seen in the distance of an hour. However
you may begin there you might fill the
birds to run them from down by
working the pump as filling the leaks.
If I can do any thing today is
by one afternoon this morning as Sunday
evening I leave town. I am starting
early and will be home.

Sincerely

V. Peck

A. H. THURSTON
MANAGER



BROADWAY, BARCLAY & VESEY STS.

Astor House

New York July 24 1905

Dear Mr. Schuff,

I stopped here - my old residence -
to write a few words which might
go off with the 4 P.M. train.

I've seen Mr. S. and he repeated
what he already said twice, that
he would place an interest in the
side see his friend who is a
young man at 3 P.M. and
expects to arrange matters by
to-morrow. I shall certainly be
disappointed if his expectations are
not realized.

Would like much to know how
the selves have behaved. As you
will remember 2, 3, 6, and 7 have
the old steel wire will $\frac{1}{2}$ sec.
If there should be trouble $\frac{3}{2}$ it

ought to be on them and
rather on the velvet, and I
then on the others because of
the peculiar stroke. The new wa-
sters have been finished this
morning and on my next trip
I shall bring them out.

I hope that to-morrow will bring
something new at evening.
Also that you will be quite
free in your smaller endeavors
important just now.

Mr. Andrews has not yet made
connection with his friends. I shall
be very disappointed they are
out of town to-day. He will
send out some pipe for direct
connection to the boiler, also a
trap. He thinks we feed nothing
but water into the engine, will
dry steam it will work much
better.

I believe now that the
most satisfactory and practical
way would be to use them



A. H. THURSTON
MANAGER

Astor House

BROADWAY, BARCLAY & VESEY STS.

New York

old brass connections and make
expensive joints or some flexible
connections. Note Please send
the two brass connections with all
nuts and washers to Pearce on
receipt of this. I shall have them
fixed up and also provide for
regulation so that the piston
will operate properly without
that disagreeable cack. The old
connections are finished will
look much better and simpler
also the noise will be decreased.
I may perhaps make something
which will serve as the
suction opening on the
bottom so as to fill
the air and at the same

time reduce the noise made by the suction valves. The noise made by them is the principal nuisance. They have $\frac{1}{16}$ " stroke whereas the compression valves stroke only $\frac{1}{32}$ ".

We must do everything possible to get the machine in perfect shape. It seems that not much is needed now. Of course if something goes very under the steam there will be delay and trouble. I hope the parts will submit to the rough treatment for a while. Yesterday I never heard on the steam fall except very late when it had fallen below normal. I tell you frankly I was afraid the upper bearing would give way on the bad place. The vibration seems to me too intense and I did not want to risk it and strain that part much more. Will full steam it would have had to stand about 4 times as much. Sincerely, J. T. Taylor



BROADWAY, BARCLAY & VESEY STS.

A. H. THURSTON
MANAGER

Astor House

New York July 24 1900

Dear Mr. Scherff,

I stopped here - my old residence -
to write a few words which might
go off with the 4 P.M. train.

I just saw Mr. S. and he repeated
that he already said twice, that
he would place an interest. He
will see his friend who is a
young man at 9 P.M. and
expects to arrange matters by
tomorrow. I shall certainly be
disappointed if his expectations are
not realized.

Wanted like much to know how
the velvet line behaved. As you
will remember 2, 3, 6, and 7 from
the old steelworks will be sold.
If there should be trouble at

ought to be on there and
rather on the velvet, God I
than on the other beam of
the greater stock. The new ones
there have been finished this
morning and on my next trip
I shall bring them out.

I hope that to-morrow will bring
something new and encouraging.
Also that you will be successful
in your small endeavors
important just now.

Mr. Andrews has not yet made
connection with his friends. Much
to my disappointment they are
out of town to-day. He will
send out some pipe for direct
connection to the boiler, also a
trap. He thinks we feed nothing
but water into the engine, with
dry steam it will work much
better.

I believe now that the
most satisfactory and practical
way would be to use the

A. H. THURSTON
MANAGER



BROADWAY, BARCLAY & VESEY STS.

Astor House

New York

all brass connections and make
expandable joints or some flexible
connections. Note Please send
the two brass connections with all
nuts and washers to Parsons on
receipt of this. I shall have them
fixed up and also provide for
regulation so that the piston
will operate properly without
that disagreeable creak. The old
connections are finished with
bronze much better and simpler
also the noise will be deadened.
I may perhaps make something
which will screw on the
suction opening on the
bottom so as to filter
the air and let the same

Line reduce the noise made by
the suction valves. The noise
made by them is the principal
nuisance. They have $\frac{1}{16}$ " stroke
whereas the compression valves vibrate
only $\frac{1}{32}$ ".

We must do everything possible to
get the machine in presentable
shape. It seems that not much
is needed now. Of course
if something goes wrong under
the steam there will be delay
and trouble. I hope the parts
will submit to the rough treat-
ment for a while. Yesterday I
never found on the steam pipe
except very late when it had
fallen below zero. I tell you
frankly I was afraid the upper
part casting would fall on
the bed plate. The vibration seems
to me too intense and I don't
not want to risk it and strain
that part much more. Will pull
steam if wind had been steady about
4 lines or more. Sincerely
J. T. Taylor

NEW YORK CITY ADDRESS: "WALDORF-ASTORIA"
PHILADELPHIA CITY ADDRESS: "WALDORF-ASTORIA"



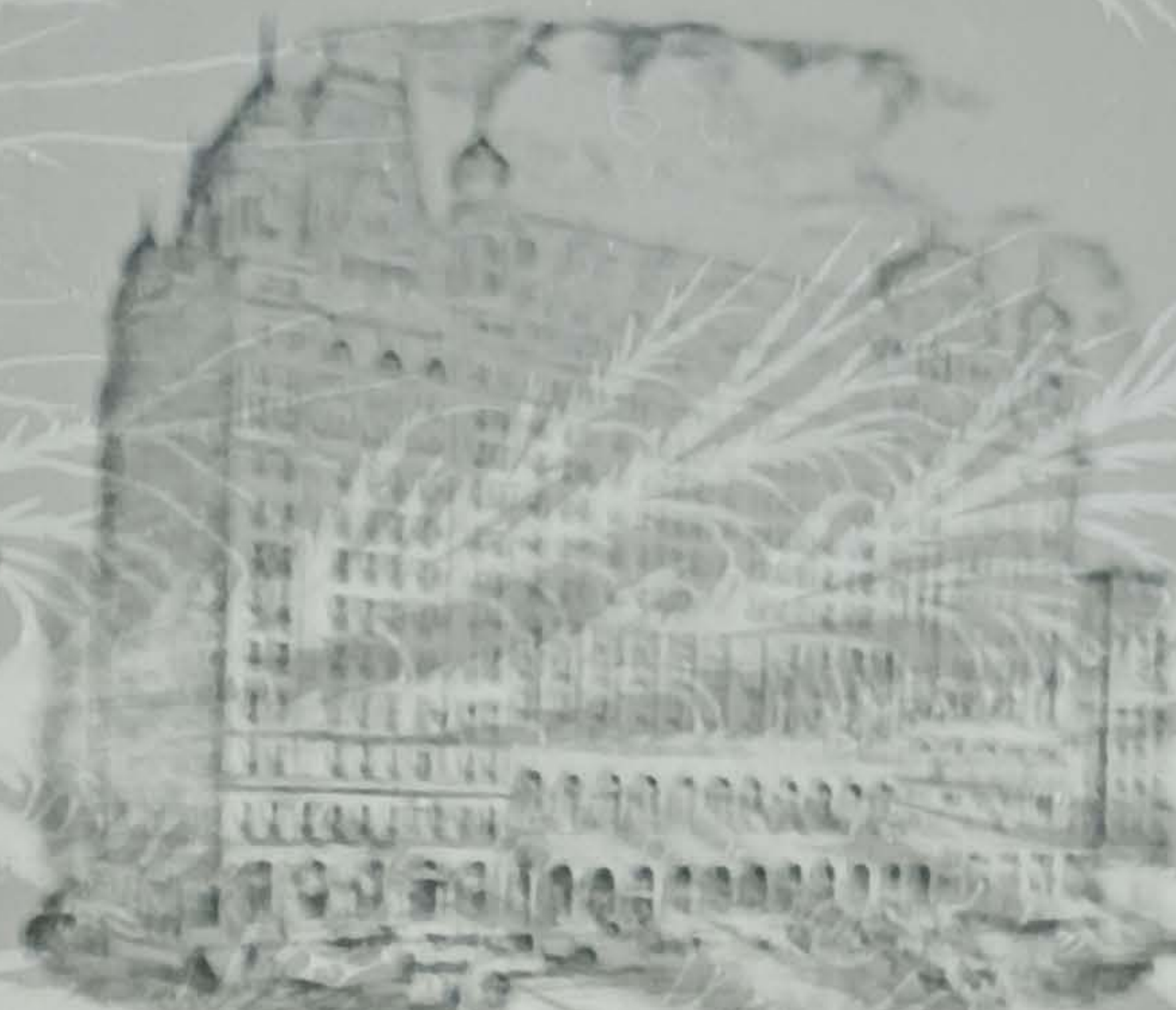
THE WALDORF

THE WALDORF-ASTORIA, NEW YORK
HOTEL BELLEVUE, PHILADELPHIA
THE STRATFORD, PHILADELPHIA
BULLITT BUILDING RESTAURANT,
PHILADELPHIA

GEORGE C. WOLFE, PROP.

The Waldorf-Astoria.

Fifth Avenue, 33rd and 34th Streets
and West Court.



THE ASTORIA

New York July 24 1905

Dear Mr. Scherff,

I returned last night with the
colds freshly developed in the throat
your administration and finding several
troubles, has been in my room. The
recently prolonged correspondence.
This morning again my thoughts are
centered on a pressing matter and
I am unable to write you fully as
I expect for the guidance of the
larger than in to take the matter
of Colorado Springs in charge. Besides
something new develops today which
might materially alter the course

affairs. I hope it will do
you with him from me as soon
as possible, or rather you will
see he means. I am very eager
to get this business on little
particulars and need for them it will
not be difficult as they get paid.
The introduction was very much improved
with the present progress. I have made
and is fully convinced that the
convention has great prospects before
it. He is going to begin work to day
and perhaps he may come to
my residence soon. At any rate
I feel that he may be depended
upon as an enthusiastic supporter
of the movement or rather movement
which the Free Trade Association is
engaged in.
Sincerely,
Wm. L. Garrison
get all the word and ask you get
to go - "I fear means if you can?"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
MULLITT BUILDING RESTAURANT,
PHILADELPHIA.
GEO. C. BOLDT, PROP.

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BOLDT, PHILADELPHIA"

The Waldorf-Astoria, Fifth Avenue, 33rd and 34th Streets and Astor Court,




THE ASTORIA

New York July 24 1905

Dear Mr. Scherff,

I wrote to-day from down town
expecting that my letter would reach
you with this evening train. The
most important thing was to express
the how large Coen Connections will
all ripple as much to Peace.
Please do this without delay so
that we may have them altered as
I propose. The machine will then
make a much better impression.
I have a scheme to kill the noise
of the machine valves by a little

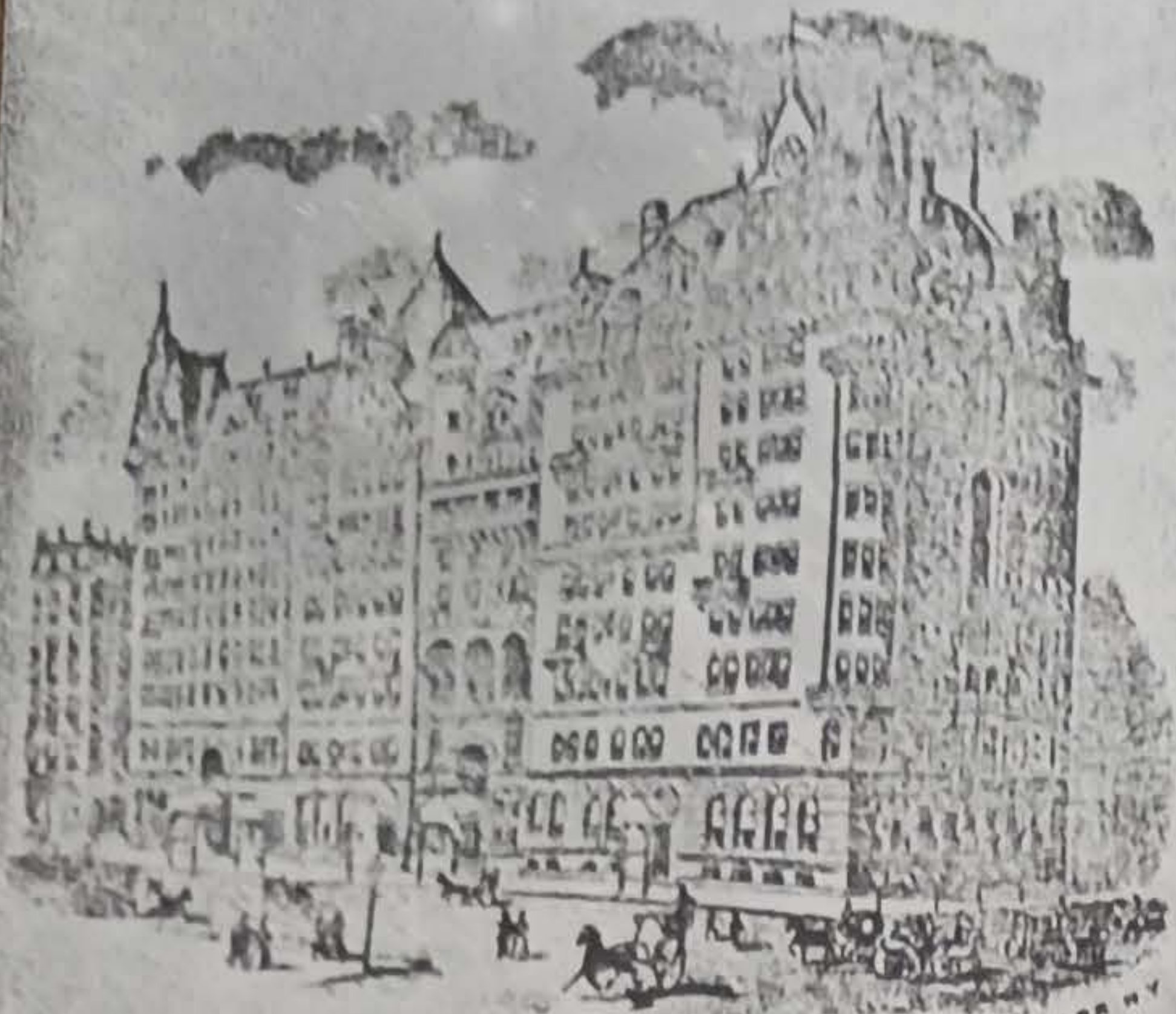
connected to the inlet of the
large green connection in front.

With reference to I have agreed
that the best way to get rid of
the noise of the exhaust would be
to make a hole in the chimney
above the roof. Peter is an ex-
pert in such work I understood as
he might do that. He must take
out a piece of brick. This will be
a hole of about $2\frac{1}{2}" \times 8"$  $2\frac{1}{2}"$.
This will permit to stick the pipe
in at an elbow and then pull through
the hole and then turn the elbow
so that the stream of the exhaust
will shoot out upwards. Perhaps
a short nipple can be screwed into
the elbow, say, 4" long. Please see
what can be done about this.

P.S.,

I forgot to tell you that Sincerely
Mr. Andrews is very satisfied, but of course
that has improved him more than the engine was Mr. Scherff's pipe

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS, BOLDT, PHILADELPHIA



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
HOTEL BELLEVUE, PHILADELPHIA.
THE STRATFORD, PHILADELPHIA.
BULLITT BUILDING RESTAURANT,
PHILADELPHIA.

GEO. C. BOLDT, PRGR.

The Waldorf-Astoria,

Fifth Avenue, 33rd and 34th Streets
and Astor Court,



THE ASTORIA

New York July 25 1901

Dear Mr. Schuyler

Disappointed not to find a
note from you this evening.

Saw Mr. S. this afternoon. He
said his friend was delayed and
will return on Monday. Thanks
he will please deliver. Also said
he was sorry that perhaps he may
be in his way. I believe that
he will be a valuable man for me.

I also note proposition for
an old acquaintance of mine who

[illegible]

To the Hon. Secy of the Navy
 Washington D.C.
 Dear Sir
 I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the above subject. I am sorry to hear that you are unable to visit the Navy Yard at this time. I am, however, glad to hear that you are well and hope that you will be able to visit the Yard in the near future. I am, Sir, very respectfully,
 Yours, Sir, very truly,
 J. M. Smith

Mrs. ~~Frederick~~ J. P. Seale has now
 the ~~following~~ report. I do not know
 whether I can appear next after
 Mrs. ~~Frederick~~ Seale. Still
 I like to ~~be~~ ~~in~~ ~~the~~ ~~house~~ ~~in~~
 there living.

Smug - 7-10

The other had made him
leave his own yesterday.
Up to this point I have
nothing from him. My
other chance of which I
wrote is good but he
woud as yet for my friend
now as to that Cloud.

Both you are aware that
the last day is 40 days
from the date of publication.
That is it published? You
have to see them clippings
then which will tell you
the date. If from 20th
then we would not have them
to day 1 or day 2. Some of T.
Please find clippings and communicate of them.

P.S. remember that
I now have a 2nd from some
place of the Waldorf Astoria
New York. I have
heard of the Waldorf
Astoria as it appeared
July 27/1901.
Somewhere.

Dear Mr. Schuyler,

Your letter just

received. I am sorry

that I cannot give you

the paper.

But I have the

the volume of the

last volume. The copy

from probably England

the volume.

I am very

truly yours

In the next section of report to be made
we are to construct the report.
I shall employ values in the report
which will be used in the report.
to make better. There will be competition
among by the means of the report.
The chief condition is the Indian. It is
on the high ground. Yesterday has been made
better. We can not propose to a full
jump into the river for small interest. Say
a great quantity of the main work to think
as simply on the at our last Saturday.
recovered. That will be very much improved
from interest in all the Indian. Believes the
the people, but at all times proposition will go
through. Some one

I made him
 yesterday.
 I have
 him. My
 of which I
 but in
 for my friend
 that cloud.
 a more than
 in 40 days
 of publication
 publication? You
 then clippings
 will tell you
 in June 2nd
 of how true
 by 2. June 2nd
 and communication of some

P.S. I now remember that
 there is a 2nd Gross univ. which I
 thought of The Waldorf-Astoria
 New York. I may
 return as it appears. You will find
 July 27/1905.

Dear Dr. Schaff,

Your letter just
 arrived. I have
 been thinking of
 you for some time.
 I have been thinking
 of you for some time.
 The copy
 has been
 the above.

Schaff

In the next machine
we are to construct
I shall employ valves
which will be over
a much better. These
can be made good, an
The chief trouble is
a high ~~pressure~~ yesterday
water, we can not proportion
pumps into the reservoir for small
a great quantity of the steam
air simply on this is one bill
current. That will be very much
for rehearsal in all and Andrew
the party, liberal elements proportion
through. Sub

1. machine of weight & strength
for construction and other improvements
valves I think this machine
has more will make competition
better. There is impossible thing.
means good, as impossible thing.
problem is
The Andrews has made
yesterday he has made
can say proposition to a fellow
the various for small interest. Says
utilizing the new wants to think
on them and now till Saturday.
That will be very much improved
in all and Andrews believes the
lateral extension proposition will go
through. Some one

The other hand must have
 seen his man yesterday.
 Up to that moment I had
 nothing from him. My
 other chance of which I
 wrote is good but no
 word as yet from my friend
 now as to that. I hope
 that you are aware that
 the last day is 40 days
 from the date of publication
 when it is published? You
 have two or three clippings
 then which will tell you
 the date. If I am 26th
 then it would not have been
 to Aug 1 or Aug 2. I am of T.
 Please find clippings and communicate of once

P.S. I now remember that
 there is a 2nd cross in
 the right of The Waldorf
 and I have seen it
 somewhere as I appear
 Dear Dr. Schaefer
 Your letter
 about the
 date of the
 first paper
 that he
 the volume
 last will
 have probably
 some more

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

New York Aug 7 1901-

Dear Mr. Schuch,

Up to this moment 9 P.M. I have
not yet received your letter telling me
of the sum of the order here to
order for the one outfit. I suppose
it will reach me next morning.

I had the small outfit brought
- down to be sent hurriedly -
out of which you will know. I
had a few expressions of interest
from them. They will put the small
outfit in a good shape and return a

have seen by partly to do so. When
this is done I shall be able to show
them more and then we will discuss
the improvements for the manufacturing
point of view. Mr. Powell's paper
includes this. I can produce an
article with a great deal of detail. My idea
is to let the value of this improved
type be known on my own account.
We can easily sell a few and have
over the Army. I should be right
to be able to examine it a mutually
satisfactory arrangement. When
the manufacturing of a great number
I want to give them an idea of the
large number of which I found in
London. I am sure it is also true
that it is now a excellent market
being large enough for business use.
Please let all the things we have there
together. I shall be able to do it.

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
 PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
 THE BELLEVUE-STRATFORD, PHILADELPHIA.



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

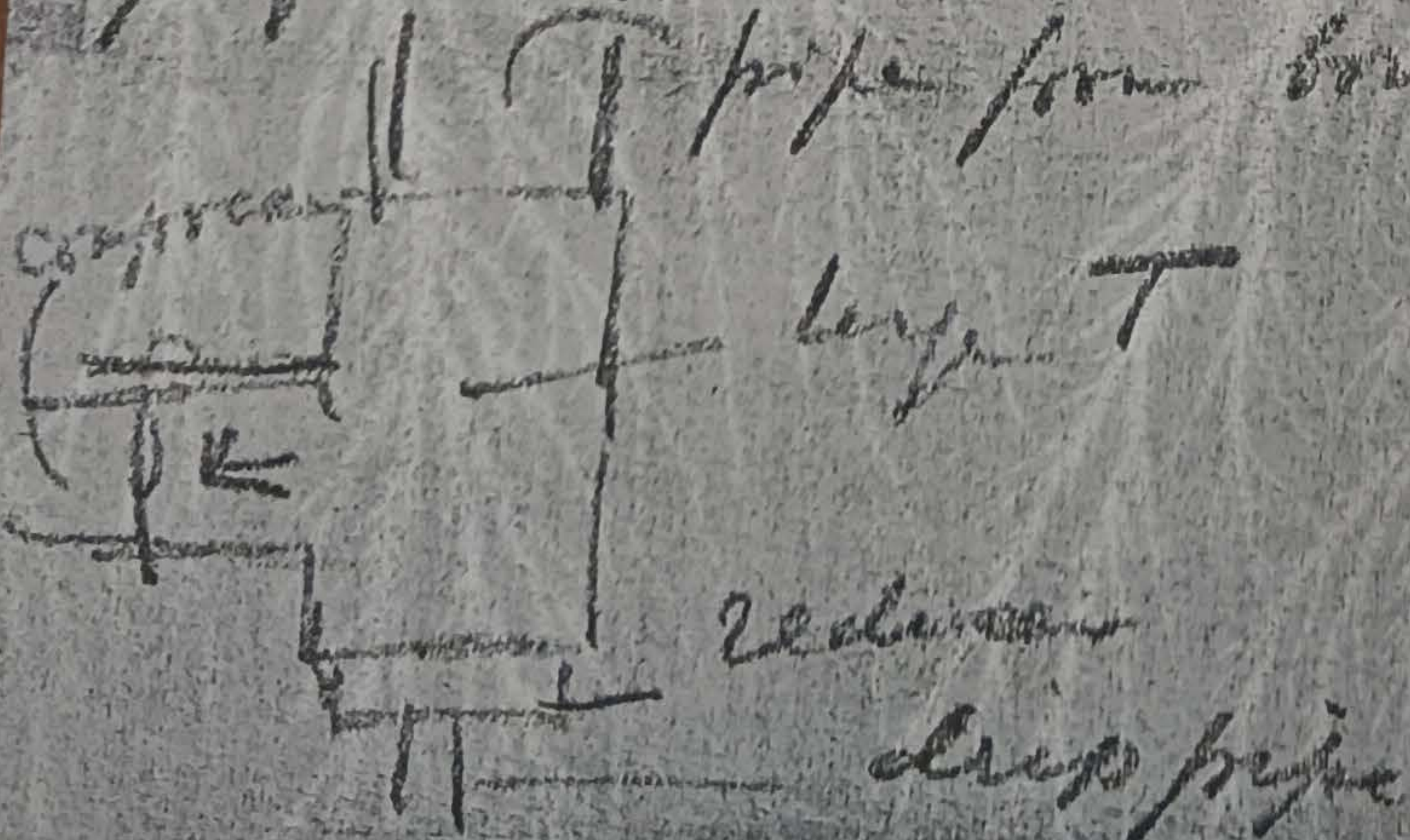
New York

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necessary to know. It is important to
 put the two sides of the question
 before me at the same time.
 Being being that I have done
 a lot of thinking on the same
 values and have gone a step further.
 Expect to begin work on the
 L-rooms. I am particularly interested
 in the fact that the Congress will
 do all their improvement. It
 ought to give us a great surprise.

- trying to get as large as
 possible for the
 gas duct and some other action
 I want to know one thing as
 far as the pressure is concerned
 it is about 100 lbs. I think one
 thing is to know - whether
 the gas duct is the one which
 will enter the cylinder in line.

Now from the above water of
 Sunday night. I think about that for
 time in Scotland? I believe the
 father has plenty of money but
 they are going to make a blunder.
 Do not forget drip on bottom of new
 pipe. I would make it like this



Sunday
 - Test

serve to turn on
at start off the steam
so as to know the
pressure on the
engine when we
work with the valve
partially opened. The
gauge showed an over-
sight to the pipe
though it is small and
long, probably leak
pipe that water or drop that the way
is leaky.

Sincerely

A. T. C.

The Waldorf-Astoria
New York.

Aug. 13. 1905

Dear Mr. Scherff,

Thanking you for the
express with the mail
this afternoon with
the compressor I find
the way to
put in the steel-
blades in the valves

The letter could not the space between
and properly. For - the bottoms of the
kegs you are not cups to their studs
expands with the are greater in the
last modification) motion valves as the
made. In the cups blades are thicker
1, 2, 3, 4 (compression and the stroke larger,
valves) the bottom is plain but the valves
turned out a little like at 5 months
while the stud is not.
The cups 5, 6, 7, 8 are properly.
not turned out, but we ought to have
the studs belonging to a clearance between
them are. Besides valves that are

The Waldorf-Astoria
New York.

Aug. 13. 1905

Dear Mr. Scherff,

Thanking you for the

express with the machine

this afternoon with

the Compressor I find

on drop the the way 7-

put in the steel -

blades in the valves

The letter could not be
all proper. Per - the bo
haps you are not
acquainted with the
last modification) motion
made. In the caps blades
1, 2, 3, 4 (compression and the
valves) the bottom is plain
turned out a little
while the stud is not.
The caps 5, 6, 7 & are proper
not turned out, but
the studs belonging to a steam
then are. Besides the engine
valve

could not see the space between
the Per - the bottoms of the
the caps to their study
will the are greater in the
(icden) material values as the
the caps blades are thicker
bottom is as the stroke larger
little plain here the valves
is not like out to mouth
2, & are properly
but we ought to have
trying to clear space between
sides the engine as the
valve that now

server to turn on
at start off the steam
so as to know the
position on the
engine when we
look with the valve
partially open. The
gauge showed an arrow
pointed to the finger
through a scale and
long, preferably leave
finger note that valve on drip that
is leaky.

Sammy

A. T. C.

The
Dear Mr.
Thurston
expressing
them after
the Camp
the
put in
Hides

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
 PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
 THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

New York Aug. 15 1905

Dear Mr. Schuff

Nothing developed with Anderson today
 except that he has four people who
 will examine the compound as if it
 working in Peter's factory put up all
 the money necessary. This is all right
 for the plan but of course just now.
 I hope the two others, breeding etc.
 will bring the machine up to the
 required mark.

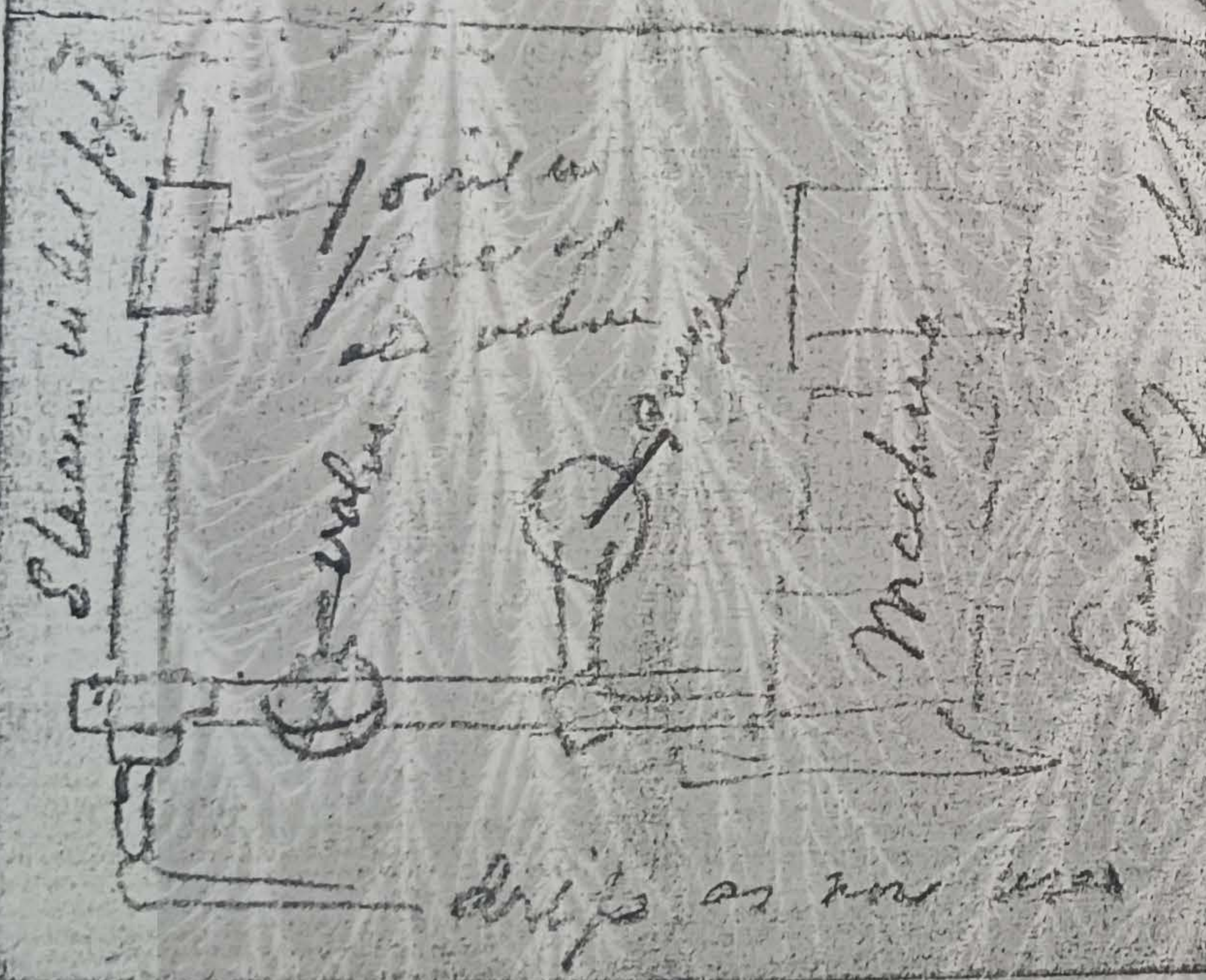
Try to tell me how I do a
 best fall today while trying to get

on a shaman. Several joints of brass
have developed. I sustained a violent strain
of the hand. That brings to my mind
the advantage of having money and
for sale automobiles.
We have looked hard on the model
card, and by tomorrow evening it will be
probably drawn up in model patterns
and then there will be some thing. I
expect that work will begin in a
day or two. It will be a fine mi-
shun card.

J. D. mentions the not complete silence.
Have heard nothing from Selma. Three days
have passed without seeing a disagreeable
letter, it is uncanny.

I hope you are doing them all. You
are disappointed not to receive
word this evening.
Sincerely
W. T. T.

We need a modification
 color in the arrangement
 of the valves
 and ganges. It will
 be necessary to have a
 piston which close
 to the bottom.



The Waldorf-Astoria
 New York.

Aug. 16. 1905

Dear Mr. Schaff,

Your letter was
 received and
 all details about
 the work for me
 to be completed
 by the time the
 drawing will be
 ready to start
 work will begin.

The day after. From a low and level
the magnificent point which has received
of view the improve- a letter, he said
ments are consider- which indicates the
able. The whole Brown says for the
encouragement of the Congress will be
party will be soon ready tomorrow, the
practical and sub- here others probably
stantial. The matter by Friday evening.
will also be cheaper to Troubles before but
make. I am led on by the hope of starting
telephone today that a good business makes
his party will be then seen smaller.

The Waldorf-Astoria
New York.

Aug. 16. 1901

Dear Mr. Scherff,

Your letter received.
I have called many
times about
the matter but for want
of a telephone
number. The
drawing will be
ready for review and
work in a few days.

Meeting

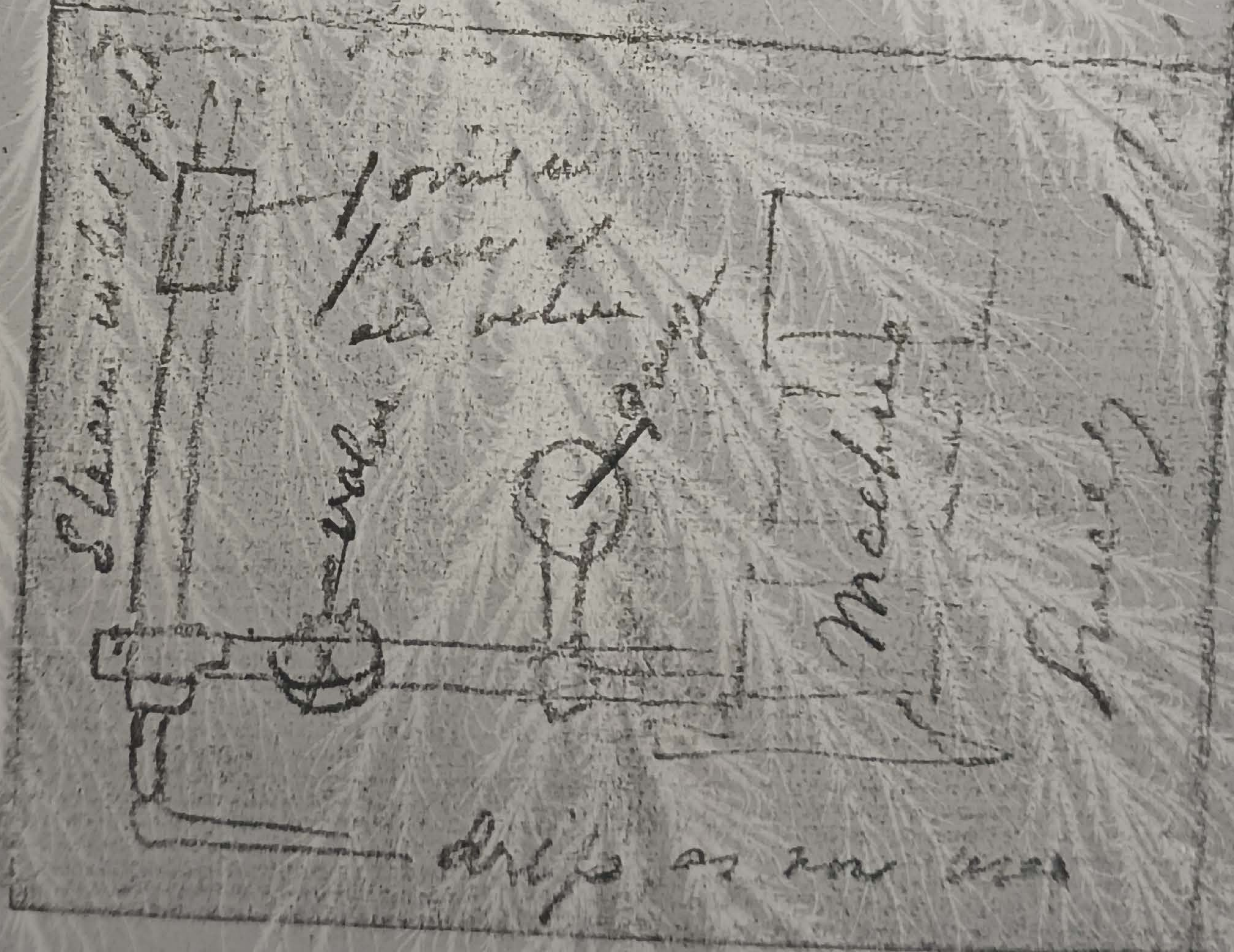
Friday

as per letter

The day after, from
the sheep-keepers from
as far as the upper-
reaches, on a wide-
scale. The whole
country was in a
state of readiness
to meet the new
herd. The men
will also be cheaper to
make.
Seen later on by the
elephant and a few
his party were then

From the town of West
which has received
a letter, he said
which indicates we
are going for the
Congress will be
in some way known, the
ed sub-
has been probably
by Friday evening.
Troubles before but
by the hope of starting
that a good number of
are then seen in the

We want a modified
 color in the arrange-
 ment of the valves
 and gages. It will
 be necessary to have a
 pressure indicator above
 the tank.



You
 have
 all a
 detail
 of the
 work
 done
 and
 the
 work
 done

delay because of
 the new valves. I
 am quite interested
 to see how the
 things will work
 as soon as they
 are in place.
 They will be
 out easily.

Truly
 in haste

The Waldorf Astoria
 New York.

Aug. 17 1905

Dear Mr. Scherff,

We have had some
 of our valves will be
 ready for you
 back. The one is
 sufficiently complete
 to make a test which
 you will find
 is a good one.

new will work much better than old, and I will see by
while the work on this the new house nearly
10th or 12th and finished.
good adorns and made I will get the
boards getting them from the
first one before we at expect to take
shape. All details then on Saturday.
can settle them. It will probably
afternoon at work on the little house
pattern for the house to fit the post etc.
at the things will be the same
begin tomorrow. I will have made

79
The Waldorf-Astoria
New York.

Aug. 17 1905

Dear Mr. Schuff,

We have had some
drawings with the
intent of showing you
the best way to
reach. The one is
sufficiently complete
to show a lot of
game in each place
is as shown here

her will work much better
better than at. We
While the work on this end
10th we released an
port edwards was made
lands getting them I shall
from one action on his
shape. all details at copy
even collect them then on
afternoon as work on It will
better from the land when a
at the things will be fit
begin to - tomorrow. So the
and

to reach he should see 5
ad. and I also need
on this the one hundred nearly
and a finished.

our side I shall get the
them his friends L-norm
at expect to take
them out Saturday.
It will probably
be a little time
to fit the post etc.
so that we shall
not have much

deleg because
to me perhaps 1/2

an girl interested
to see how the

steps will be
a more clear

~~the first of the~~
~~the first of the~~

they will be
out easily

Every
in the

been

We

from

the

the

back

sufficient

to be

game

is it

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

New York Aug 20 1905

Dear Mr. Schuff,

You must have noticed that this afternoon when we began the experiment with the compressor I first let the drop valve open to blow out all the water and then turned on rather quickly the steam in the machine. It started instantly as I expected. I proceeded in this manner just to see whether the troubles caused by the condensation water in the engine which we could not start and overcome. Indeedly they came as the experience showed. There was one good result. The sand was that we did not need

to believe the compressor. The third the
the center of the machine is where it should be.
The fourth the the hole is clear on
the above. The fifth the the machine
behaves better under all conditions, even
if it falls out. The sixth is that the
noise of the lower unsharpening is de-
cided less. This may be good enough
for the day.

I notice that the pipe carrying the volume
passed to compressor is not much longer
the pipe through a very narrow hole and
long chamber. As long as this the
stange will be gone soon.

The broken piece of pipe before the
room should be replaced.

I believe that the large exhaust
pipe should show the shaft when in
a central position. The fire is great,
then I tried to burn the shaft at
near the

Please take care to keep everything clean.
Do not forget correspondence. During the fall

The Waldorf-Astoria
New York.

Aug. 22. 1905-

Dear Mr. Schmitt,

A disappointment as
to repairs. They will
not be ready for probably
two days, but the new
ring for large compressor is
made. We have sent
the pattern of base for
new pedestal to the
foundry. Work has
begun on the parts.

I see from the papers I don't pretend —
this morning that my stationing some methods
friend J. P. has been It must have been created
cruising near the a ship in the opposite
Ct. and is now at Camp. The address
Newport. While there I was afraid they would
is no answer there not.
is hope, though I The new method seen
am beginning to share to be progressing well,
your skepticism. Expect to be at h-
was pleased to receive Moore during
this morning my Truly
W. T. C.

The Waldorf-Astoria
New York.

Aug. 22. 1905-

Dear Mr. Schuyt,

A disappointment as
to returns. They will
not be ready for probably
two days, but the new
way for type composition is
made. We have sent
the pattern of type for
new Bulletin to the
foundry. Work has
begun on the parts.

I see from the papers that
this morning that my
friend J.P. has been
cruising near the
C.L. is now at
Newport. While there I
is no answer there
is hope, though I
am beginning to have to
your skepticism. Expect
has pleased to receive
this morning my

papers I have secured -
by stationary some method
has been It must have been
then a stir in the opposition
of camps. The additional
claims were inserted.
There I was afraid they would
be.

The new method seen
there to be preparing well,
expected to be out to -

William Brown

W. T. S.

My letter was sent last
 day. The section of
 the connecting channel
 is large. Of some poles
 in the the shop is in
 order, no spiders webs. My
 ink letters are quite
 about.

I expect to be out
 Wednesday as the great uncertainty on the
 money

W. Taylor

The Waldorf-Astoria
 New York.

Aug. 24 1905

Dear Mr. Scherff,

The valves are
 very handsome
 I have had an
 experiment made on the model in
 very simple but important
 in the long opening of
 the valves. The steel
 blades will spin around
 as they revolve and
 thus be uniform.

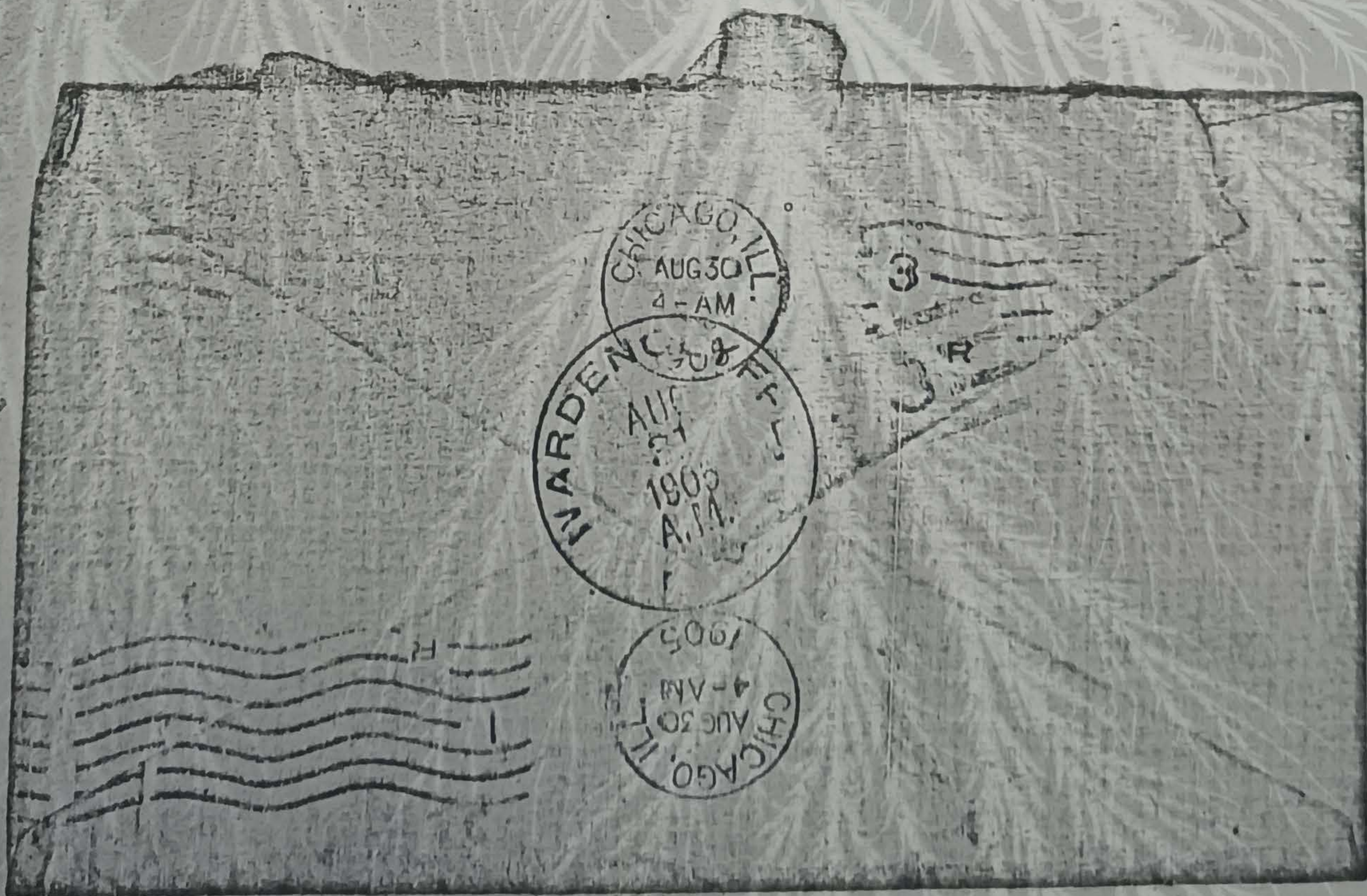
The Waldorf-Astoria
 Fifth Avenue 330 and 34th Streets
 and Astor Court.
 New York.



George Scherff
 Wardenlyffe
 L. S.

The exhaust connection
 from the engine also
 disengaged. The the
 air will flow to the
 four compressor chambers
 from the central portion
 of the connecting tube through
 small narrow holes. On
 the bottom there will
 be a drip for any oil
 that may gather there.
 The pressure connection
 to the back will have
 provision with valves
 1 1/4". All this will
 be delivered to-morrow.

The work on the same
 machine is also progressing.
 I will send you of the
 following 1) for the gas
 out, 2) repair leak on
 pipe at port large rod
 in order 3) get plenty of
 fuel 4) take off the back-
 pressure valve of slip on
 the pipe leading to the
 gauge that is now
 the pressure on the machine
 a road almost closing the
 pipe. This will kill the
 vibration of the indicator
 on the gauge, otherwise



The Masbort-Historia
Fifth Avenue 338 and 34th Streets
and Astor Court,
New York.



Wesley Scherff
Madame de la

W. S.

at least annular. The
from the I have also
described. The
and flow to the I will
from compressor chambers following
from the central portion out,
the connecting tubes through
which many holes. On pipe
the bottom there will
be a drop for any oil
but may gather there. The first
the pressure connections
the bottom will be
provided with valves, a 2 inch
1 1/4". All this will
be delivered to the
pipe
with
on the

at least annular. The
from the bottom also. The
disposed of. The
will flow to the I was
four compressor chambers following
from the central portion out,
the connecting tubes being
real heavy tubes. The pipe
the bottom. There will be
a drop for any oil fuel &
the way between them. The
the pressure chambers. The pipe
the back will be
provided with valves, a road
1 1/4". All this will
be delivered to the main,
the pipe
vibration
on the

The work on the same
is also progressing,
to the I am now going of the
hangers following I have the grain
put in, and repair leak on
the large pipe and put large rods
in order to get plenty of
water fuel by taking off the back-
set from below I slip in
there. The pipe leading to the
sawage shed in which
the pressure on the machine
is nearly a rod almost closing the
pipe. This will kill the
vibration of the machine
on the saw, otherwise

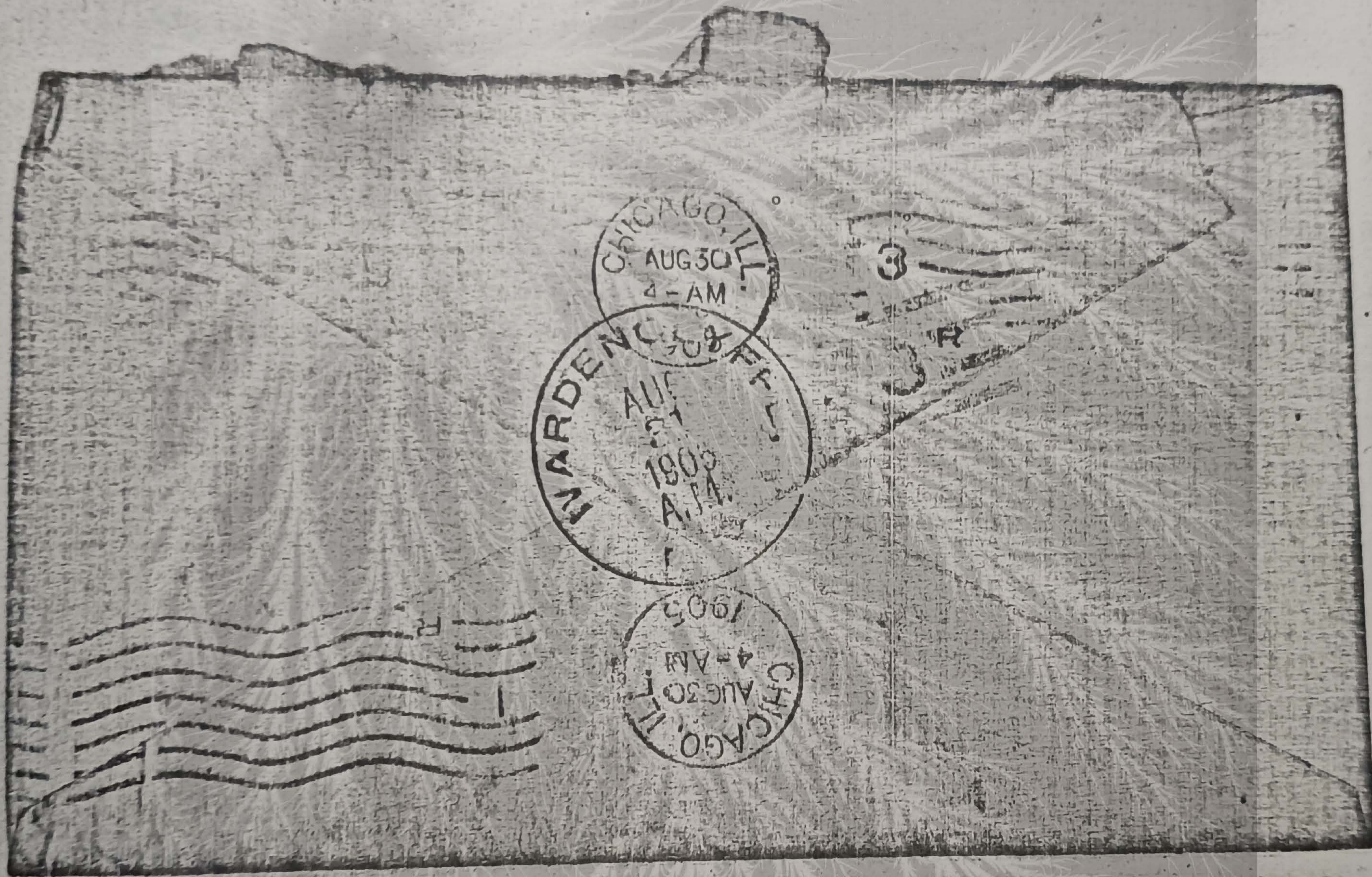
The letter will not last
long. The section
the connecting channel
be large. Of them Peter
see the the shop in 2
order, no spider webs. 7) Dear
some letters are spoken The
about.

I expect to be out
Wednesday at the first meeting
Friday

→ To the

The v
the
is the
has

on the page, otherwise



difficultly understood

Please continue to
send condensers and fix
appreciate as well as you
can. The boxes may be
less common but they are
very good. I have 10 for sale.

must follow the term
the cars. Then I
shall bring with me
for the day after to the
cars. The car is getting
into shape, should be
ready by end of the week.
Loving & true

The Waldorf-Astoria
New York.

Sep. 20 1905

der D. Schaff,

I wish in haste to
tell you sorrowfully
enough that the
little fellow has
been killed - discolored
with this morning
paper. The poor
man has been overtaken

on your charges & I am after my
it seems ^{that} ~~that~~ he ^{friend} Charles just
is an ~~old~~ ^{old} criminal, back for abroad.
I never want have the business look
anyone out — not promising. If
any possible, to be honest we can
consider any further to for in we must
business with him look for somebody
is really at / else but I should
the question / say that on them
I have not 7 — ^{proposition} ~~proposition~~ ^{then} ~~then~~
can getting better, will be in fact

The Waldorf-Astoria
New York.

Sept. 20 1905

Dear Dr. Schuyt,

I wish to have to

tell you something

very much

but I will not

begin to do so

until this morning

paper. The form

has been sent

on your charges & I am
is ~~seem~~ ^{to} ~~be~~ ^{him} he
is an ~~old~~ ^{criminal} ~~criminal~~ ^{friend}
I have ~~not~~ ^{known} ~~him~~ ^{the}
Knight ~~and~~ ^{not}
any ~~trouble~~ ^{to} ~~be~~ ^{sh}
consider any ~~farther~~ ^{to} ~~be~~ ^{for}
known ~~with~~ ^{him} ~~look~~
is ~~shelly~~ ^{at} ~~else~~
R ~~guarantee~~ ^{day} ~~the~~
I ~~have~~ ^{not} ~~7~~ ^{prop}
on ~~setting~~ ^{better} ~~will~~

charges & I am after my
friend Charles just
criminally, back from abroad.
not here. The business looks
more promising. If
ble. To be honest we care
further. Left in we must
have look for somebody
else but I should
say that on the
7th proposition. Then
better, will be a great

difficultly in unloading
Capital.

Please continue to
kind condenses & fit
appreciate as well as you
can. The boxes must be

sent soon but before
I can do so I must

wait for the weather to
clear up.

I must return the term
to the bars. There I

shall be with you
probably the day after to-morrow.

The car is getting
into shape, should be

ready by end of this week.

Very truly
yours

Dear Sir

I am

very

kindly

remembering

you

and

hope

you

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

New York Oct. 3 1905

Dear Mr. Scherff,

Your letter just received. I have
written you that I shall come out
Thursday noon. The velvets for compression
will be ready to deliver. I also
expect to bring out a spool
for the charging coil as well as one
for a new secondary to be used
from the very much to make
a test with the velvets and must

bring the business completely to
the City, so as to settle certain
important details of manufacturing
which is to pull me out
of the hole.

My friend J. P. said many
things to me recently that he re-
gards the business is not in
the line. It is rather late in
the day for him to speculate but
I can afford to talk him to
look elsewhere for funds. We shall
get them I feel sure because
the proposition is a very good
one and both myself & I
can convince that the line
of the business is good.

During the week
Please have passed particularly person entire
long. Hope you have found second day.

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, New York.
THE BELLEVUE-STRATFORD, Philadelphia.



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

New York Oct. 6 1905

Dear Mr. Scherff

There changes on the instrument
will take all the time to-morrow
and it will not be possible for me
to come out as I expected before Sunday.

I found this day that a number of
small improvements can be made on
this occasion so that by next week
all ought to be in very good shape.

This Sunday I look will be
broken down but I was glad to
find that I look the same

That the insulation process is as
applied it but was perfect.
There was not the slightest defect
anywhere. The break occurred along
the rubber through the solder joint.
When we remedy the weakness in that
spot it will be possible to strain
the coil much higher. The customer
holds out very well as I have put
it to a rather severe test.

I had a talk today with Johnson
the lawyer of the property owners down
there. He seems to be rather a nice
fellow and I understood that they are
to make a number of changes. He
told me among others that they are
to have a different name for this is confidential.
I was glad to hear all and also that
it was out.

Wrote problem books for

Lucy N. Fisher

A detailed black and white illustration of a large, multi-story building with many windows and a prominent central tower, likely a hotel or government building. The building has a complex facade with numerous windows and a central tower with a pointed roof. The illustration is in a sketchy, etched style.

A detailed black and white illustration of the Hotel de Ville in Paris. The building is a grand, multi-story structure with a complex roofline featuring several towers and flags. The facade is covered in numerous windows and decorative elements. In the foreground, a street scene is depicted with several figures and horse-drawn carriages, suggesting a busy urban environment. The style is that of a fine-lined drawing or engraving.

A detailed black and white sketch of a grand, multi-story building, likely a hotel or a government edifice. The building features a complex facade with numerous windows, decorative cornices, and several prominent towers or spires. The perspective is from a low angle, looking up at the building, which emphasizes its height and scale. The drawing style is expressive, with visible lines and shading that give it a sense of depth and texture.

THE ASTORIA

Dear Mr. Scherff

New York Oct. 9 1905

I saw my friend ~~Asplund~~ ^{Asplund} today and he declared himself ready to take up ~~the~~ ^{the} ~~work~~ ^{work} ~~and~~ ^{and} ~~dictate~~ ^{dictate} a program for manufacture of the instruments, perhaps forming a small company. He is an old friend and absolutely sure. That would be excellent but for the ~~troubles~~ ^{troubles} of the moment. When does the P. Inf. note become due? Will you please let me hear about it by return mail.

The overfriendly people called on me. They
~~were~~ ~~went~~ ~~to~~ ~~confer~~ ~~at~~ ~~Shaw's~~ I saw
 the operations ~~went~~. They say they will

can through the original proposition with
Seth. This means that I must have been
up to something for them on that day.
It is still a problem. Suppose you
propose Randall that I give him a 2 m.
note for say 100 g. which I can
developing this. He might have really
L. except if not too so 30 days obligation.
At any rate you may try.

The Pearson people expect to finish
the other ~~document~~ ^{document} by tomorrow all except
searching. They will not be charging
cost. It will be necessary for you to
hurry the ~~documents~~ with three papers and
they will have been treated thoroughly.
I expect the letter to reach you by
noon tomorrow Tuesday and you might
have been ~~done~~ ^{done} the ~~document~~ ^{document}
including ~~documents~~ ^{documents} which is still good.
What I want to get particularly is the
new secondary which I have been pursuing
out well. Then you cannot do anything else
but ~~document~~ ^{document} by express so that I get it
in a more ~~arranging~~ ^{arranging} manner. It is better

me. Meanwhile please do
all as agreed. Hope the
cost will come out all
right.

Truly
yours

I enclose will
revert you

W. Verbeke

The Waldorf-Astoria
New York.

Oct. 9, 1900.

Dear Mr. Scherff,

The late experience with
Clark & Greenman has
completely upset me. I
feel that to be generous
as I have proposed myself
to be with them would
be out of place. Every
dollar that I get for
manufacture will be pain-
fully earned and I think
that if I can spare some

Mr. George Scherff
Wardeneffe
L.I.

thing for others. I had better ready to in good evening
 let those people who are order. It would be
 most desirable. Please be sure.
 go carefully over the I have thought often
 accounts as see just that I have learned from
 it done to them. I a friend who was with
 shall pay only for work. That if we
 they have done nothing had the or have we would
 more. As you know I do not mind the distances.
 have intended to pay them It would be practicable to
 full time as though they live anywhere in the
 had work without interruption. neighbourhood to if the
 I shall see some friends running the staying would
 to day but cannot yet be a small matter.
 make a proposition before. If something develops
 the new arrangement will be day you will hear from



Mr. George Scherff

Wardenechff

L. J.

The Waldorf-Astoria
New York.

Oct. 9. 1904.

Dear Dr. Schacht,

The Coleridge experiment with
Clark & Dr. Clark has been
completely successful. I
feel that to be generous,
as I have proposed myself
to be with them would
be out of place. Every
clothing article I get for
manufacture will be permi-
sibly accepted as I think
that if I can spare some-

The Waldborf-Vistoria
New York.

Oct. 9, 1904.

Dear Dr. Schacht,

The Coleridge Express comes with
 Clerk to South Western
 completely apart from me, I
 feel that he is generous
 as I have proposed myself
 to be with them would
 be out of place. Every
 other thing I get for
 the manufacture will be permi-
 fully considered and I think
 that if I can spare some-

thing for others. I had better ready
let those ~~benefit~~ who are order.
most deserving. Please be wise
go carefully over the I have
accounts as see just what that
it does to them. I a friend
shall pay only for work. not to be
they have done nothing but she
more. As you know I have been
intended to pay them living a
full time as though they neighbor
had work without interruption. plant
I shall see some friends running
to day but cannot yet be a
much a ~~provision~~ before. If
the new ~~arrangement~~ is all to day

I had better ready I in for writing
who are order. It would be
Please be wise.

I have thought after
just that that I have learnt from
a friend who was sent
for work. That if we
had the or how we would
have to travel the distance.

I would be practicable to
live anywhere in the
neighbourhood as if the
place would be regular
visiting the staying would
be a small matter.

If something develops
as all to day you will hear from

now. / Meanwhile please do
all as agreed. Hope the
work will come out all
right.

Yours
J

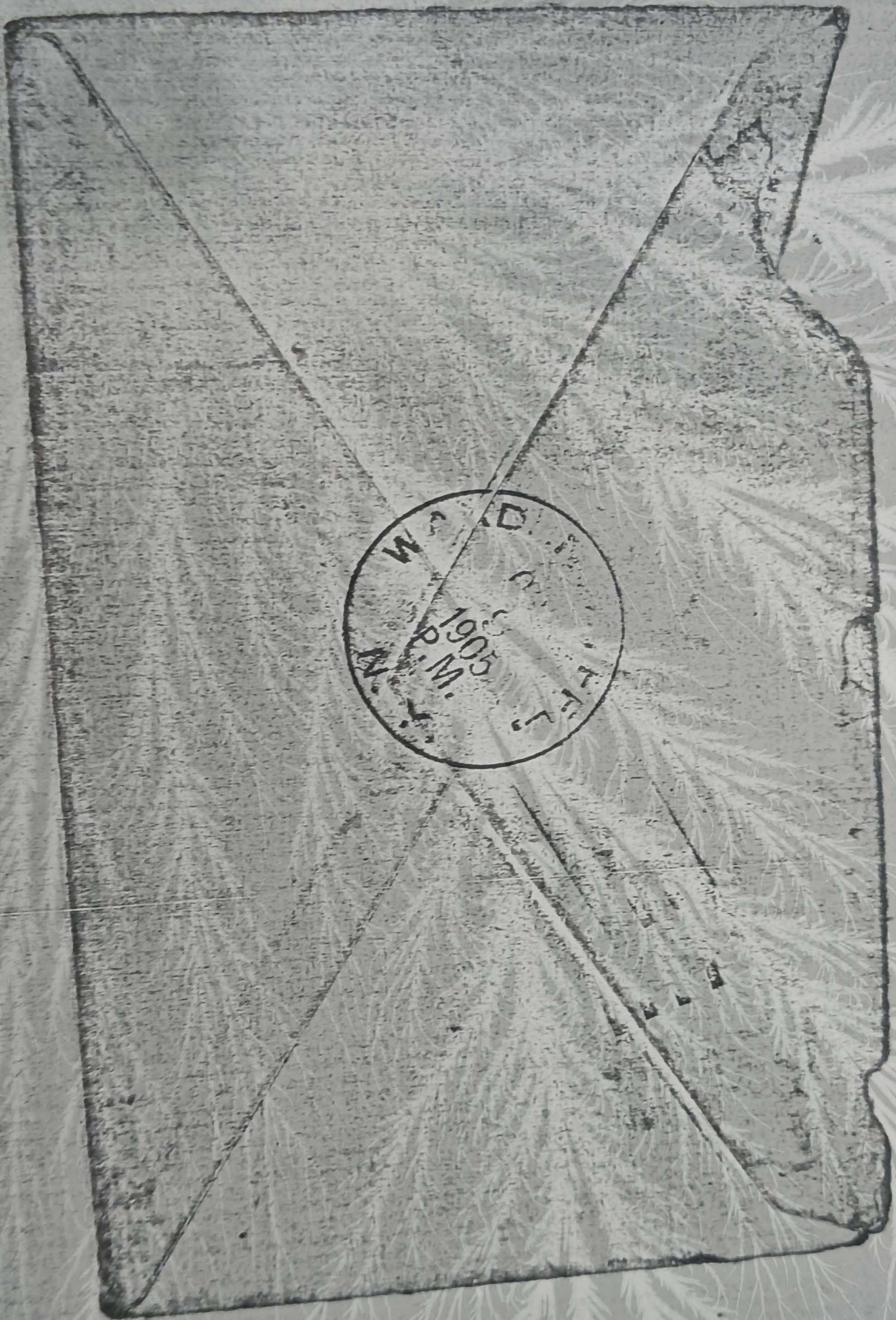
I should well
rejoice to hear
from you.

Yours
J

Dear

The
Clerk to
complete
part of the
as I have
to be
be out
dotted
Manufacture
fully
and if

And a description of the
the same day you will hear from



NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

New York Oct. 11 1905

Dear Mr. Scherff,

I got the instrument today and
am well satisfied with its appearance.
The coil you forwarded (Sunday) seems
to be all right, but the condenser
could not stand a developed
defect when I showed it. That is
only a trifling defect in the
dies cast. The other machine
will be probably finished tomorrow.

I expect that you have some the
charging and so that there will be
no second day to finish.

Hope you are progressing in
the making of the new Condenser.

Also that you will perform a
coup d'état or rather a coup
de force successfully.

I never was so interested in my life.
The troubles are so many that I am
sure to see what solution they
have formulated for. This time he
will have to send some letters with
a full bundle.

The Ocean people are fixing on the
price of the instrument. I hope it will be
reasonable. We shall have to wait the
condenser and make the Condenser. All
the work can be done in New York.
Will write you if anything of importance should occur.
Yours at last

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF

THE WALDORF-ASTORIA, NEW YORK
THE BELLEVUE-STRATFORD, PHILADELPHIA



THE BELLEVUE-STRATFORD



THE ASTORIA

The Waldorf-Astoria,

New York Oct. 11 1905

Dear Mr. Scherff,

I got the instrument today and
am well satisfied with its appearance.
The coil you forwarded (secondary) seems
to be all right, but the condenser
could not stand & developed a
defect when I shined it. That is
only a trifling defect and can be re-
dressed easily. The other machine
will be probably finished tomorrow.

I expect that you have found the
charging end so that there will be
no secondary to be found.

Hope you are progressing in
the making up of the new columns.
Also that you will perform a
coup d'état or rather a coup
de force successfully.

I have no interests in my life.
The troubles are so many that I am
unable to see what evolution the good
has formulated for. This time he
will have to send some letters with
a full bundle.

The Ocean people are figuring on the
price of the instrument. I hope it will be
reasonable. We shall have to wait the
scoundrels and make the Condenser. All
the rest can be done in their shop.
Will write you if anything of importance should occur.
Yours at last

Things will look
better. I am absolutely
sure to carry out the
proposition will happen
on some terms.

The other instrument has been
changed and I shall get it
in shape all ready with
internal &c. I propose to
put the new secondary in
it and then to show
one machine completely for
demonstration to my friend. They want form as in
you will hear from me as soon
as possible.

Truly

W. T. Hill

The Waldorf-Astoria.
New York.

Oct. 11, 1901.

Dear Dr. Schuyler

The instrument reached
me last night and
I worked with it until
a late hour. The sec-
ondary seems to be all
right despite of the
hours. I was afraid
they would form as in
did not apply the
vacuum-form after the

Comprehension. When he built very carefully,
about the same time we hope you will succeed
must apply the process in the same pro-
for a long time and with position. He would
care. The results will be important as they
be excellent. I am
am quite convinced, ^{stage} write a letter
- You don't say anything - to Garrison. I am
thing about the new but disappointed at his
space (charging only) but not rather than
I expect that it will be the same as so
be around to-day. Please insist.
remember that the conditions. It can be bridge
will be a most beautiful part a little gap

The Waldorf-Astoria.
New York.

Oct. 11, 1901.

Dear Dr. Schuyler

The winter has reached
its last night and
I fought with it until
a late hour. The severe
day seems to be all
right despite of the
hours. I was afraid
they would form as we
did not apply the
occasional after the
fall.

Compressor. When we
start the engine we
must supply the pressure
for a long time and
soon. The results will
be excellent. I am
am quite convinced,
you did not say any-
thing about the
space (charging and)
I expect that it will
be around 10-15, then
reduced to the end,
and a small charge.

When we build very carefully,
we can hope you will succeed
in procuring a fine Randall pro-
ad with position. It would
certainly be important at this
stage.

Write a letter
regarding - to Garrison. I am
here but dependent at his
end) how but rather than
it will be Nelson are so
I have insisted.

endless. If we can bridge
Gadsden just a little way

Wendy that in the
next we make,
My thinking the
unknown the the
blame I got fine
steamer offers. There
is no doubt that there
all the adjustments are
conveniently made. These
units will be removed
later. I feel quite
pleased
will visit L. morning
evening again. Possibly
earlier.
Please call L. Randolph
bureau at San Francisco
for full. sincerely A. T. C.

The Waldorf-Astoria
New York.

Oct. 15, 1905

Dear Mr. Schuyt,

I have just read
your letter and was
the secretary. You
can prepare the paper
and the arrangement
for wedding is made.
ready both parts. It
is necessary to deliver
the books from the

Could already send. I intended to visit
you to see the day after as it seems only
tomorrow as we will be in the
know something definite to improve. Evidently
of that time. The presence of the

I was surprised to hear before looking in
with the intention of being needed. You have
noted that the
it has. The mill ~~condition~~ did not
improved thing was kept the charge long
to consider how much this I believe is
the condition was due simply to
stand. It seems per-
fectly safe for I the poor condition
showed it for beyond power of the fibre
barren. He shall

The Waldorf-Astoria
New York.

Oct. 18, 1905

Dear Mr. Schuyt,

I have just read
your letter and
am exceedingly glad
to prepare the paper
and the arrangement
for wedding is made
ready both parts. It
is necessary to deliver
the books from the

Coal already and I
say to our the day after the
C. Morris and will
know something definite to
be put to me.

I was surprised to see
all the information
which I had
is here. The small
important thing was
to ascertain how much
the order was
stand. It seems per-
fectly safe for the
show is for legal
business.

and I the intended limit
day after as it seems only
will be improve. Evidently
definite to improve. Evidently
the purpose of the
and be that before working is
to be done. You have
beaten the plan
will continue to do not
as keep the charge long.
has been the I believe as
and due to apply to
per the from involving
the form of the fibre
beings. be there

Wendy that in the
next we make

By showing the
importance of the
where I get fine
theater effects. There
is no doubt that the
all the adjustments are
carefully made. These
results will be seen in the
table. I feel quite
pleased
will visit L. Morris
evening again. Possibly
earlier.
Please call on L. Rendell
Gunnison at San Francisco
for full. sincerely
A. Paul

P.S.

The overfading people
asked me to let them
I am ready to carry
out agreement. They
said that was all
they wanted to know
and they will attend
to the matter. I wish
they would act once.

The Waldorf-Astoria
New York.

Oct. 19, 1905.

Dear Mr. Schuff,

I am sorry to find
that I shall not be
able to take the early
train tomorrow Friday
as I expected. Then
business with my friend
L. as before in we
get concluded, but
we expect the

would be L - morning, either to - man afternoon
I need you to prepare or Saturday morning,
all details you can L The indications are that
show the market for the people people will
the instruments L to make a fair price. The
manufactured. Wophin Apt. told me L - day
must have that be Not I shall be sur-
vised. If you get the friends how low they
everything you can find can make them.
the causes of them Do not forget to
performance classes only free the valves a little
at manufactures we will the summer than
can know it together I have given you
in shape when I am using light oil.
out. This will be Sincerely
J. T. C. P.S.

The Waldorf-Astoria
New York.

Oct. 19, 1905

Dear Mr. Schuff,

I am sorry to find
that I shall not be
able to take the sail
boat tomorrow Friday
as I expected. The
business with my friend
L. at home is not
yet concluded, but
we expect to be
able to go.

would be L - morning, either to
I need ~~you to prepare~~ or School
see ~~del~~ ^{you can} L The school
show the market for the Per
the instruments L in make a
manufactured. Hopkin Sept. 185
must have that be Not I
said. If you get together
everything you can from make
the terms of them to be
performance classes, and free the
at manufacturers we will the
can know it together I have
in shape when I am using
one. This will be

morning, either to-morrow afternoon
or Saturday morning.
The indications are that
the people will
make a fair price. The
Dept. told me to-day
that I shall be sur-
-prised to find that they
can make them.
Do not forget to
oil the valves a little
with the pump. Then
together I have given you
I am using light oil.
Sincerely

V. T. Ash P.S.

P.S.

The Orefield people
Cults) let them
I am ready to carry
out agreement. They
said that was all
and they will attend
to the matter. I wish
they would at once.

Dear Mr

I am

that

club

have

as I

business

L. A

get

re up

at 7:30

This will

Nothing definite as yet with
my first letter.

The Waldorf-Astoria
New York.

Oct. 26, 1905.

Dear Mr. Scherff,

Please be careful

to receive anyone

who may present him-

self here asking for

you with courtesy

and show him place

mechanics have etc.

Also example of my

entire business

relation in business

very truly

from a firm
the person
capital of company

I propose to give
for all necessary
for 100 million

the person

perfect in organization and

about 20,000 capital

transfer from

proper is encouraging

Had a meeting

relation with Mr. Trach

I am full of hope he will

adverse capital still necessary. This is personal. Sincerely

which will include
fully the present
to proportionate value
of the property. This
is very important.

R. Andrews has agreed
to furnish enough money
to build a Synagogue
on the site. He is a
perfectly competent
expert on the subject
to get this money
quickly & at small
expense. This is good.

R. Andrews will
take up with
manufacture body of
I get estimate of
Price for 100 sections
They gave me a close
idea yesterday. Price
of these with material
will not exceed \$20-25.
We can furnish the rest
for \$10. So that
price may be \$30-35.
Certainly there will be
plenty of purchasers

There was nothing definite as yet with
my friend Leslie.

The Waldorf-Astoria
New York.

Oct. 26, 1905.

Dear Mr. Scherff,

Please be careful

to receive anyone

who presents him -

self here asking for

you with courtesy

as to his place

between them etc.

Also enclosing by my

will relations in business

and. This is personal. Sincerely
V. T. T.

should all understand
fully the present
as property value
of the property. This
is very important,

B. Andrews has agreed
to furnish enough money
to cover a special election
one-third of the
perfection. Congress. He
expected to be able
to get this money
quickly as it will
be paid. This is good.

He
knows
I go
Pear
They
idea
of the
will
be
for
posi
cert
plan

decide
value
Then
I
has agreed
money
election
we are
are, he
dilemma
number
small
paid.

R. G. Johnson will
take up million of
manufactures to-day when
I get estimate of
Pease for 100 machines
They gave me a close
idea yesterday. Price
of them with 2 material
will not exceed \$25-30
he can furnish the rest
for \$10 So that
possible maybe \$35-40
covering them with the
plenty of purchasers

[illegible]

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
 PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
 THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

New York Oct. 29 1901

Dear Dr. Schull,

I am quite pleased with you under-
 standing with Herbert. He is surprised
 he will and I have a feeling that
 he will develop into a splendid com-
 mercial man. The fine stories of
 the D.T.C. with respect to me.

Please keep in mind that I am
 blowing about my place all the
 time and trying to attract some
 millionaires in my undertaking. I
 one might hear of at any time and

NEW YORK CABLE ADDRESS "WALDORF, NEW YORK"
 PHILADELPHIA CABLE ADDRESS "BELLEVUE, PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
 THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

New York Oct. 30 1904

Dear Mr. Scherff,

The shoes were forwarded this
 morning. I trust they have reached
 you by this time.

The day passed without my getting
 tired of my pen. I had so much
 to do as the details of my work
 at the Peace Days took much
 of my time.

I am expressing the warmest
 thanks for the pleasure and
 interest you have taken in
 the work (as you) as great.

Seven papers between each layer. The
space or each end $\frac{1}{8}$ ".
I advise that the outer flanges have
no grooves. You may break one by
taking them off, after coil is wound. Do
not forget to make a slot with
the saw for the connection of the
ends to the screw in the middle
flange. Do this before beginning the
winding, as it will be difficult
to do it later.

As you will see the first few
papers will be a little narrower
on account of the square corners on
the main plate. Remember that
when beginning the distance between
the outer centers of side flanges is $4\frac{1}{8}$ ".

Mr. Wainwright was not a body. I had
not much to advise to improve the
trial. Expect to do so in a day or two.

P.S. Several electricians
and wireless performers called at house.
The new coil has attracted attention. They asked how long the

papers will run

from the rubber crests
birds. From the binding
both they are something
3" long. I think the
endless with 4 sheets
will show the work
to show.

The one people called
to day time they will
come out with me as
soon as possible probably
Thursday.

Both plants are some
type as the others have
been off early.

Ploughshare, Quincy, N. York

Please look out for wood.
Solid me if you have from
The Waldorf Astoria
New York.

Nov. 13 1905.

Dear Dr. Scherff,

Thirteen seems to be

my lucky number.

First of all I see

The F. just for an
hour as he was

going out of his office.

He was most friendly

and said that he

was sorry to hear

to go out but he R R Company the
will talk with me send something what
some other day. I from an overpayment.
have my men as one The machine came this
as the law of gravi- evening (brought by a
tation works. I know messenger when I sent)
it. and it works splendid.
See Rogers about the and it works splendid.
order for 100 machines. by The steam for
said he would let me clear across. Then
know. I think some of the flanges is en-
thing will come of my pletely covered with
proposition. lighter than the
also get the chief spring is set last.
engineer & advise the steam come also

Please look out for word,
and tell me if you have from
The Waldorf-Astoria
New York.

Nov. 13 1905.

Dear Dr. Schuyt,

Thirteen seems to be
a lucky number

For I see I have

the F. for an

amount as he was

very out of his office.

He was most friendly

and said that he

was very happy.

to go out but he the
with talk with me said
some other day. I
have my men as one The
as the law of good - every
action works. I have
it.

See Stephens about the and
order for 100 horses. he by
said he would let me clear
them. I think some of the
thing will come of my
organization. by the
also let the chief
engineer & advisor of
Bureau

to be R. R. - Company. He
said some things which
I. gave me encouragement,
as one. The picture was this
evening (brought by a
man who I saw)
about the end of work splendid.
The stream from
clear across. One
of the flanges is en-
tirely covered with
light when the
spring is set hot.
The area also

from the rubber covered
boxes. From the binding
both the ~~are~~ ^{are} sometimes
3" long. I think the
condition with 4 sheets
is a ~~lot~~ ^{lot} the work
done.

The one paper called
L. by the ~~is~~ ^{is} will
come out ~~in~~ ⁱⁿ a
few ~~of~~ ^{of} ~~the~~ ^{the} ~~pages~~ ^{pages}
There are
Both ~~pages~~ ^{pages} are ~~some~~ ^{some}
type as the ~~other~~ ^{other} ~~have~~ ^{have}
been off ~~and~~ ^{and}.

Ploughshare Press N.Y.

Plen
Vol

Des

The

By

For

The

from

Long

the

and

as

The Waldorf-Astoria
New York.

Dec. 4 1905

My dear Mr. Schuyler,

I am a little late
to you that I have managed
to get one of the best
little. Of course I am
lovely back and will
have careful nursing
for some time.
Please to have follow

up the matter with L & me in the
the O. J. Breakfast 7 days.
do not think that I have the
they must have a strong opinion
on the point of the matter can be avoided
many to go of the day 7 on
debtless and I have been
- better for the future. I have
been to have a strong opinion
better than to be in the same
this through some of the best like
wonderfully from the day
with the best of the day
There let me know
less as soon as possible
Sincerely & Truly

The Waldorf-Astoria
New York.

Dec. 4 1905.

My dear Mr. Schuyler

I am a little late in
replying to you. I have managed
to get some of the
little of course I am
loosely back and will
be most careful concerning
for some time.
Please to have your

[illegible]

My

I

you

to go

with

some

time

for

peace

will it would be folly to
use anything else. In this
summer the covering of the upper
section will not need to be
specifically designed, can be the
same as that of the section below.

I found Japanese paper which will
be suitable for cushions. Expect
to place order to morning as
soon as I hear from the
mercatorly Mr. G.

Can you tell me about the
note P. J. Dore? When will
it be done? Have packed
my old chest book and do
not know date.

Sincerely

N. Tark

SS

March 24 1906.

Dear Mr. Scherff,

I am glad to have
received it a conclusion will
reference to the covering
of the lower which can
be improved, after
all glass ribbed is the
best. It is the cheapest
covering to begin with.
The charge is 8 1/2 cents per
square foot 1/8" thick. The

outer area of the house is
approximately 30000 sq. feet.

Cost of material $30000 \times \frac{8.5}{100} =$

$85 \times 30 = \$2550$ with legs

$\$3000$ will cover total cost.

Note: That we do not require
sheeting. It will be

run 32 strips

up to hold plates.

a) we do not want any windows

wherever

c) we get all the light in
from inside

d) but insulation on outside
against moisture

e) perfectly fireproof covering.

f) There will be very little
as improving

g) Work inside will always
be kept warm to dry
as well insulated.

h) The plates which come up
to 12 feet length will

be cut all to exact size

i) Order can be filled
within six weeks

quickest time
solved.

The house can be painted
any color if necessary. Also
in any ornamental way.

As I have told this

B

March 28 1906.

Dear Mr. Scherff,

I am glad to have
received a conclusion with
reference to the covering
of the tower which can
not be improved, after
all glass ribbed is the
best. It is the cheapest
covering to begin with.
The charge is 8 1/2 cents per
square foot 1/8" thick. The

outer area of the house is
approximately 30000 Sq. feet.

Cost of material $30000 \times \frac{8.5}{100} =$

$85 \times 30 = \text{Rs } 2550$ with labor

Rs 3000 = will cover total cost.

Note: That we do not require
sheet piling. i.e. that will be
necessary is to run 32 strips
up to the total plates.

b) we do not want any windows //
thereover

c) we get all the light in
room inside

d) best insulation on outside
against moisture

e) perfectly fireproof covering.

f) Tower will look very well
as improving

g) Wood inside will always
be kept warm to dry
and well insulated.

h) The plates which come up
to 12 feet length will
be cut all to exact size

i) Order can be filled
within six weeks

j) quickest time
to be.

The tower can be painted
any color if necessary. Also
in any cream color very
sh. I am sure of this

rather it would be fully to
use anything else. In this
summer the covering of the upper
section will not need to be
specifically designed, can be the
same as that of the section below.

I found Japanese paper which will
be suitable for condensation. Expect
to place order to morning as
soon as I hear from the Bureau -
hastily J. G. C.

Can you tell me about the
role P. J. Bank? When will
it be done? Haven't packed
any of my old chess books & do
not know date.

Sincerely

N. T. Park

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
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THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

New York April 28 1906

Dear H. Scherff-

Inclosed check \$2000 with pleasure
forwarded to H. Fenwick on acct rent.
Say that my business is developing slowly
but steadily. Also say I have not to
do anything more for Clark on my
account. I asked H. Fenwick help on
his behalf but in view of my experience
since I was like to keep away from Clark.
has very been to say that Mr. R.
has a bad cold and is not likely to
come down here before Monday. Intended

Received this morning
summons in the Clerk
letter. It was thrown
through the door just
as I opened it. The
fellow tried to get into
my room last night
at bedtime & about.

To-morrow I hope to
see my friend F.
was unmerciful to her.
never

N York

P.S.
Please write

The Waldorf-Astoria
New York.

March 27, 1908.

Dear Mr. Scherff,

I expect that the
Condenser frames (6)
will be shipped by
to-morrow. You will
be pleased to find
that I have made an
improvement which
does away with the

receiving of money — glad to come but
separate connection to his home requires the
last term after he gives proper notice
the conductor of con- of a few months to
pleted. the firm still has

I found the Japanese employs him. I encourage
papers which is extremely high. I encourage
high as very high. him to stay there but
ought to go good I want to
with. request as I like

After calling this him I am sorry
evening in up to date. that he does not
attends with a Cardinal's approval the unusual
ring on one of his chambers for edowment.
figures. he was in

The Waldorf-Astoria
New York.

March 27, 1906.

Dear Mr. Scherff,

I expect that the
Condenser frames (6)
will be shipped by
6 - P.M. tomorrow. You will
be pleased to find
that I have made an
improvement which
does away with the

receiving of money —
separate connection to the
end terminated after
the conduct of com —
pleted. of a

I found the Japanese the
paper which is extremely un-
lucky as very thin. I
ought to have found
verities.

After calling the
evening in up to date
office with a Cardinal's
ring on one of his
fingers. He was in

my — glad to come back but
decision to his home regarding the
after — he is a proper soldier
and com — of a few months to
experience the firm which was
extremely employs him. I encourage
them. Now to stay there but
good I must be
regret as I like
them. him to be sorry
to — that he does not
Cardinal's opposite the unusual
his chances for a document.
to be

Received this morning
summons is the Clerk
better. It was thrown
through the door just
as I quit it. The
fellow tried to get into Den
my room last night
at twelve o'clock.

To-morrow I hope to
see my friend F. I
was unsuccessful to see
him
meeting

P.S.
Please write
N. F. S.

Conc
will
be
the
impr
does

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

New York March 24, 1906

Dear Dr. Scherff,

Your letter just received. My last
one has evidently not reached you yet.
In reference to glass covering I learn
from Hallowell Bros. who did quite a lot
of work for my friends Sharp & White at N.P.K.
that glass can be had (same kind) tinted blue
& any color. For $\frac{1}{8}$ " thickness 10¢ per sq. foot
and for $\frac{3}{16}$ " 15¢. The cost of the frame
is not prohibitive. Order can be filled
30-60 days.

The Japan paper can write that they can
make paper much thinner but is hard

There is an air bell just
sufficiently small to be
the one in water and
in the roll the
paper out as usual
between two rollers. To
improve further I would
roll the rollers close
together the paper being
squeezed, half the thickness.
What do you think of
this scheme? I believe
it is good. Would not
require additional apparatus
except two rollers and a
drive for winding up. Sincerely
yours

The Waldorf-Astoria
New York.

April 6, 1906.

Dear Dr. Schuyt,

Unless something
should prevent me I
expect to be out
there tomorrow.
Mr. Pilch has informed
me by letter that he
has not returned here but
obtained a sketch

I have an idea
to enforce that we cannot do
the printing process
I shall see to it that
Lidger as the legal
and social end art
take the case.
I am sorry for the
future of you
will see the will
some day his penally
The charges of the
American people
on account of the
printed will be over
(vacuum & pressure prices)
take them out, just

The Waldorf-Astoria
New York.

April 6, 1906.

Dear Dr. Schuyff,

Unless something

done I cannot see

myself to be out

tomorrow

Dr. Pilch has informed

me by letter that he

has not been able to

obtain a check

a judgment against him
he for the first time
is.

I shall see to it
that day as the legal
and finally end not
take the case.

I am sorry for the
mistake. You
will see the will

from pay his penalty
The charges of the
man are people for
on certain to be for

I have an idea
enforce that we cannot do
the paraffin for us
ourselves at bottom
the people
the fact, in the
Trust put the
paper rolls and app.
for receipt of
them after
a thorough
pencil and he was
(vacuum & pressure process)
take them out, put

There is an air bell just
 sufficiently strong to keep
 the cork in place on the
 inside of the bottle. The
 paper out as soon as
 the cork is rolled. To
 make the cork further I would
 like the rollers closer
 to the paper. I would
 like to help the thickener
 to do you think my
 scheme? I believe
 it is good. Would not
 require any more apparatus
 except two rollers and a
 frame for holding the paper
 in place.

we shall get. I
 think it will make
 a fine condenser with
 the thickness which are
 about equal to some
 thickness of that thin
 square brass paper &
 will of course be
 some condenser. I am
 satisfied now we must
 use the paraffin
 process before heating
 in order to be sure
 that we get rid of all
 air.
 Quincy
 N. T.

The Waldorf-Astoria
 New York.

April 16, 1906

Dear Dr. Scherff,
 Have ordered 8 teleph
 on wire of your
 apparatus for use from
 the C. in the
 height 6-10 m (1300 feet)
 the iron T 15 above,
 6 pencils (brass).
 2 pencils of lead
 can be used for the same purpose.

The Waldorf-Astoria
New York.

April 16, 1906

Dear Dr. Schuyt,

Have ordered 3 telephones
a receipt of your
disposition for the
same to be made

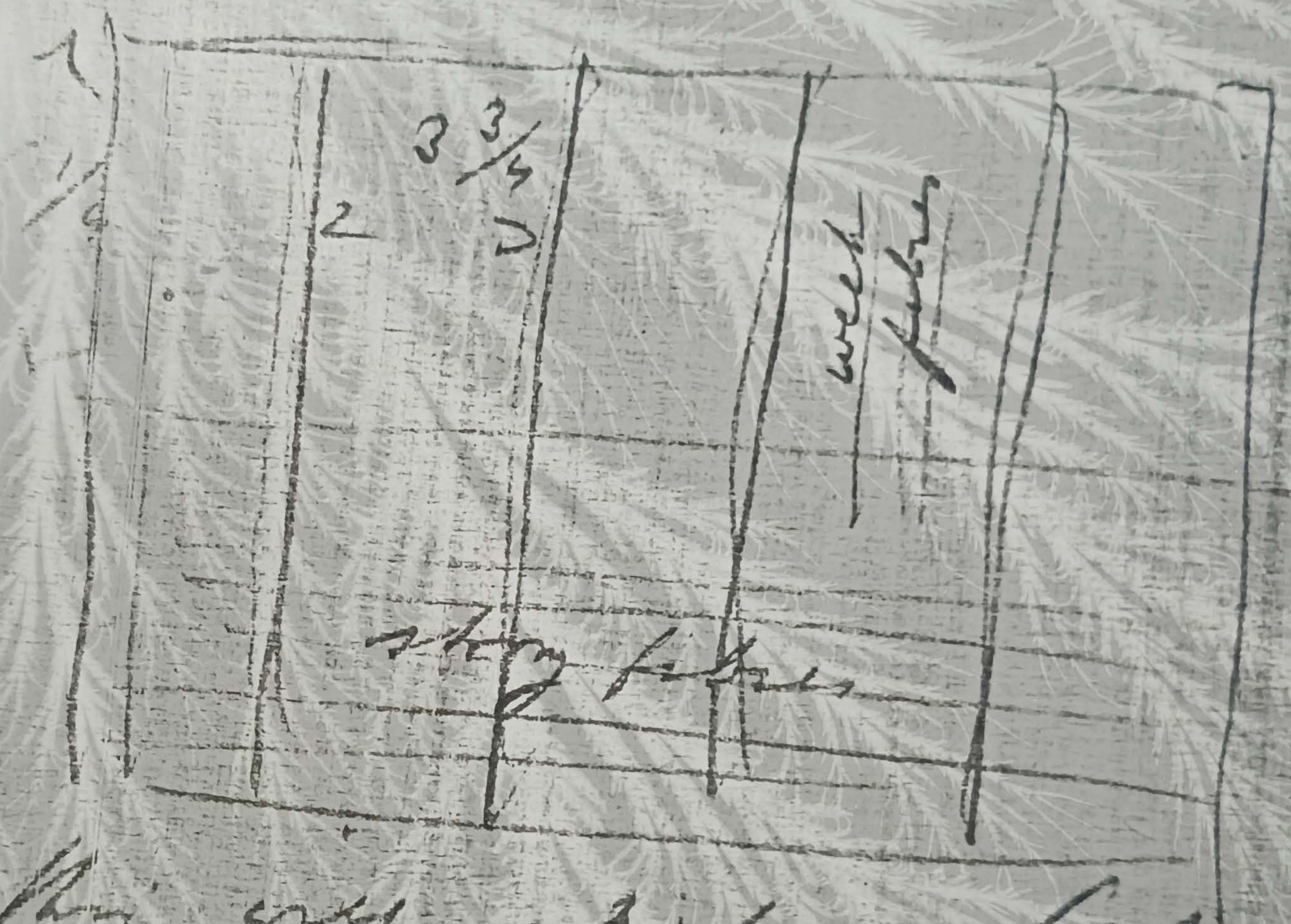
by the 15th inst. (1300 feet)
also 7 15 above,
6 feet (brass).

2 barrels of
canister shells (brass)

Lesson
will
be

Per team of 2-7 r and
June 10 sheets like
this

table
table
this
is
the



2
-
4
on

This was taken for
direction all right.
This paper we tested
yesterday was much
inferior to what

we shall get. I
 think it will make
 a fine conclusion with
 his character, which are
 about equal to from
 the character of that man.
 I am sure these papers
 will be of great value
 to the cause. I am
 obliged to you and
 to the cause. The
 process before being
 in order to be sent
 to the cause. I am
 sure it will be
 of great value.

only \$46 \pm for 1000 feet
so that my rough estimate
will probably not be
exceeded.

You might expect to
sketch for digging
trench as narrow as
it can be conveniently
and 3' deep. (or 3 1/2')

I hope to get to know
you by letter from
you that work has
begun at least on the
lower tunnel.

N. T. Smith

The Waldorf-Astoria
New York.

April 16, 1906

Dear Mr. Scherff,

The "Industries" has
an article on my
system of transmission
of power and as

I have no time you
will perhaps like
to see it from
my application on

which I would
like you to see -
no delay.

Sincerely

N. T. Smith

Drop a line when
you can.

The Waldorf-Astoria
New York.

April 23, 1906

Dear Mr. Scherff,

To-day being rainy
occurs to me to
suggest to the person-
nel that they prepa-
re some blankets for
sitting at the under-
side of the platform.
This part they could
then reserve for
bad days. They

The Waldorf-Astoria
New York.

April 16, 1906

Dear Mr. Scherff,

The "Industries" has

an article on my

system of humanism

of power and on

I have no time for

perhaps like

experience from

my application on

only of 46 $\frac{10}{100}$ per 1000 feet,
so that my rough estimate
will probably not be
exceeded.

You might expect to
find for digging
bench as narrow as
it can be conveniently
and 3' deep. (or $3\frac{1}{2}$)

I hope to get to know
how to better form
you that work has
been at least on the
line.

N. T. R. M.

The Waldorf-Astoria
New York.

April 23, 1906

Dear Mr. Scherff,

To-day being raining
occurs to me to
suggest to the person
who has the property
in some places for
standing at the under-
side of the platform.
This part they could
then ~~reverse~~ ^{use} for
bad days. They

Dear

Friend

W. T. R.

My

Dear friend

By the way, I am
unwell.

Friend

Dear

W. T. R.

T

Drop a line

very

Yours

Love

U

John

W. T. R.

Thos

Thos

Good

I forwarded yesterday
through Mrs. Davidson
the seeds, roots, & crops,
with a brace of improved
construction, & also
a few strong hickories
with 3 doz. blades.
Please assign to these
things ~~the proper~~ ^{the proper}
labor. That room

I received word by
Telephone that the
Pearce Co. will ship
all boxes & other
material for condensers
for rock, the two
copper tanks and
small boxes for coils
the ~~apparatus~~ by

N. T. 11

The Waldorf-Astoria
New York.

Apr. 24, 1906

Dear Dr. Scherff,

I forwarded yesterday
through Met. Bureau
some reports,
which shall be of interest
to your collection, also
a few things which
are also of interest.
Please send me
some of the
collections. That would

The stage rehearsal
I received the 7. A

Letter to the Secretary of the
Academy of Music.

Dear Sir,

Please

accept my

very

kind

regards

Yours

W. T. A.

The Waldorf-Astoria
New York.

April 27. 1906.

Dear Mr. Scherff

I received word of
Telephone that the
Pearce Co. will ship
all boxes and other
material for condenser
also read the how
large condenser and
small boxes for coils
then explained by

which was paper stand
540. I believe we
can make a roll over
allow as suggested before
try to get some recorded
in getting rollers as soon
help as I shall be
to take and some from
to the plant soon

~~Yours truly~~

W. T. T. T.

I am sure that if
only for a few hours
you are a true
or receipt of this
and in general whenever
you find it convenient
as the days have been
very long.

To-morrow I expect
to be back by train
R
Lucy
N York

The Waldorf-Astoria
New York.

April 29, 1906

Dear Mr. Schuff,

In thanking you
the express which made
I find that the
spot not penetrated
was about in the
middle portion. The
wisdom is only to
the fact that the

He would that the
last one to be sent
new paper for correspondence
will have picture on top
made return to address
T. Schuff, Long Island City, N.Y.
The envelope I shall have
printed return to T.
Waldorf. Then because only
way for letters will be
returned as is the case
it is better to get them
home. That will save the
trouble of a good address. The
envelope will be directed
to laboratory. Sincerely

The Waldorf-Astoria
New York.

May 1, 1906

Dear Mr. Schuff,

I just received your
letter of yesterday.

Glad the printers have
brought a hard man
by me and I am
glad to get any to this is
my will
The Pease Company shipped
and I will be sure

I may come out of
only for a few hours.
Keep me a line
on receipt of this
and in general whenever
you find it convenient
as the days here are
very long.

To-morrow I expect
to receive my friend
R. Quincy
N. T. S.

The Waldorf-Astoria
New York.

April 29, 1906

Dear Mr. Scherff,

In thinking over
the experiments made
I find that the
spot not penetrated
was about in the
middle portion. The
air does not go to
the feet. The thermometer

He would that the
last one to be set
new paper for correspondence
will have pictures on top
made return to address
T. Scherff, Long Island City, N.Y.
The envelope I shall have
prepared return to Mr. T.
Waldorf. This became only
very few letters will be
returned and in that case
it is better to get them
back. That will save the
trouble of a good address. The
envelope will be directed
to Secretary. Sincerely

The Waldorf-Astoria
New York.

May 1, 1906

Dear Mr. Scherff,

I just received your
letter of yesterday.
Glad the printers have
brought a hard man.
They are evidently anxious
to get away and this is
my will. The Pease Company shipped
and

The Waldorf-Astoria
New York.

April 29, 1906

Dear Mr. Scherff,

In thanking you
for the express which
I found that the
spot not penetrated
was about in the
middle of the
side of the
the fact that the

I may come out if
only for a few hours.

Drop in a line

or message of thanks

and in several instances

you have been

as the days have

very long.

To - morning

Look my friend

R

Lucy

N York

The Waldorf-Astoria
New York.

May 1. 1906.

Dear Mr. Schuff,

I just received your
letter yesterday.

Glad the pecaners have
started a third man.

They are awfully anxious

to get away and there is

water on my mill

The pecaners shipped

and today they will

N 1 m

Now would that the
best way to get
new paper for correspondence
will have friction on top
much reduced and address
T. Substanty, Long Island City, N.Y.
The envelope I shall have
printed when he is T. Little
will say. Then because only
very few letters will be
returned and I that case
I will be able to get them
cheap. That will save the
expense of a good address. It
correspondence will be directed
to laboratory. Sincerely
G.D.

The Waldorf-Astoria
New York.

April 29, 1906

Dear Mr. Schaff,

In thanking you
for the express which made
I find that the
spot not penetrated
was about in the
position of the
axis above the
the fact that the

The
last

The
first
then

is a pro

the

copy

proven

through

paper

most

such

broch

to be

The machine being the
 best in the region, despite
 the fact that it would bring
 considerable easier than
 than on the whole. Thus the
 impression is well to be
 the importance of delay
 carrying the drying
 process through very
 thoroughly, for if a
 paper is not a big
 moist one, it is a
 broken one. I believe

Probably read ya L-dy
 H L - morning
 The end

line being that Beaver will
that year, despite of higher water
some water being from precipitation
since there better than possible
conditions. This the present reasoning is
with to ascertain whether
we are / delay in the oil
drying will become I am
to very / saying that you
to find a / it have the
to a big / condenser (oil) nearly
may contain /
I believe /
of naturally then

you L-dy concern of I shall
have something else

I may come out if
any for a few hours.

Drop in a line

on receipt of this

and in several numbers.

You have my acknowledgments

as the things have been

very long.

T. - - - - - I expect

L. - - - - - by hand

R

Lucy

N. T. W.

The Waldorf-Astoria
New York.

May 1. 1906.

Dear Mr. Schuff,

I just received your
letter yesterday.

Glad the pictures have
arrived in good time.

They are splendid and

will be a great help to me.

My wife

The pictures are shipped

and will

probably reach you to-day. Am
in L - morning.

The ~~condition~~ (perhaps) to be
very possibly not shown
as his case is not quite
in the ~~condition~~ in case.

from ~~the~~ ~~condition~~. Then they
have been a few days but

The fact that it is ~~not~~ ~~not~~
the ~~change~~ and their sleep ~~is~~ ~~not~~
not ~~not~~ that is ~~not~~ right. You

I am quite ~~not~~ ~~not~~ to see
a lot of ~~not~~ when I am
I am out L - morning. Perhaps

To-day I am meeting the ~~Perce~~
~~manager~~ of the ~~collection~~

I - day. I am sure that I shall
 have something definite
 to tell you about the
 situation for covering the
 cost. I have been
 very busy lately but
 have been in London both
 as a form of proof and as
 a form of payment.
 You do not yet see
 why I have received the cable.
 I am extremely glad as it was
 shipped 21. April from
 the Port of Antwerp, which is very

Many

N T W

He would that the
last one to get
new paper for correspondence
will have picture on top
and address
T. Laboratory, Long Island City, N.Y.
The envelope I shall have
printed when he to T.
week or so. This becomes only
very few letters - and can
be used and is that case
it is better to get them
here. That will give the
benefit of a good address, which
correspondence will be directed to
T. Laboratory. Sincerely

from an examination
 must be better in
 a few days as matter
 but the character of
 the accident is not
 clear yet but it is more
 than probable that

(which) a little piece
 of the old wire I
 brought to see how it
 will stand the heat.
 It will be very good to
 insulate the ~~coils~~
 the coils if it does not
 go to pieces. I am
 very truly
 Yours
 J. T.

The Waldorf-Astoria
 New York.

May 3. 1906.

Mr. D. Scherff,

I left a note
 on your desk with
 reference to the two
 secondary coils I enc.
 enclose to be tested
 with wire all the
 better. Hope you will
 note carefully when
 the secondary ~~wire~~ breaks
 through so that we

My improve on the couple of days
seat. Very liked it I do not know what
broken down because the I shall go to R. today.
Paraffin has flown The atmosphere is not
out of it. This we right. There is a panic
there present in the Standard oil building 200.
here critics. This is due to the scare
The brush. No - 8 cheap. This is due to the scare
and 2 of being of the present kind to
be exposed with the oil in spec
this afternoon. I have managed next Friday the
also ordered new paint in tomorrow. I believe
dark color for top of the is will be in
lower platform. 21 up to the the
to get them in

The Waldorf-Astoria
New York.

May 3. 1906.

Mr. D. Scherff,

I left a note

on your desk with

reference to the two

secondary coils I con-

sidered to be broken

and was all the

same. Hope you will

note carefully when

the secondary is broken

through or not as

My impression on the couple
was very likely it I
broken down because the
Paraffine has flown
out of it. Then we
shall prevent in the
new crisis.
The bridge No. 8 deep. This
and 2 of beams. The
are exposed with beam
this afternoon. I have
also ordered new paint
dark color for tops of
lower platform. It will
to get them in.

The
 is
 I do not know what
 I shall go to R. today.
 The atmosphere is not
 right. There is a peculiar
 staided air about us.
 This is due to the sea
 breeze. The breeze is
 from the south west
 on at a speed
 between 10 and 15 miles
 per hour. I believe
 the sea will be more
 calm to-morrow.

pen as evidence
will be better
a few days to write
the the showing
the the showing
the the showing
the the showing
the the showing

clearing a little
of the old with
brought to see how it
will stand the heat
it would be very good to
include the layers of
the earth if it does not
be to go. Every
W. Taylor

Oct 8
9
on 7
refer
secon
class
with
further
note
the se
thru

414720 sq. inches for
12 lbs or twice for
50 lbs $\frac{50}{12} \times 414720$

= 1728000 sq. inches.

Cost of our sheets has

$6\frac{1}{4} \times 3\frac{3}{4} = 23.44\frac{1}{4}$

We shall get 172800

23444

sq $\frac{12 \times 12 \times 12 \times 1000}{2 \times 12} = 72000$

600 sheets each time with
some pressing will form 500
imford sheets for order. The

shall use 3000 papers per condenser. papers but in a building
consequently we have for 24 condensers 72000 sheets
leaving 60000 of condenser.

The Waldorf-Astoria
New York.

May 3, 1906

Dear Dr. Schieff,

I have ordered from
the American Wire Co 50 lb
paper (perforated) amount

they have after careful
thought the less offered
to me is best. I propose
to use 6 or seven

papers but in a building
consequently we have for 24 condensers 72000 sheets
leaving 60000 of condenser.

Cost of paper about
\$6.00 hence per
instrument paper \$0.25

When letter reaches
you we have plans
for in the book
for dry feed and
having one roll of

I suppose paper in
upright position. We
may find that we
can not ourselves

of steel in the center and the
 from above as the paper the sheet
 the same deflection light and even
 with the attached in the corners

At 1/2 hour preparation of and have been with
 the in which again in the Reasoning
 to these sheets of they say that it is
 A.A. Japanese but the very difference in
 this in which some severe burn and
 very strong in every place
 paper through paper - The quality I noted
 proved in being one was from an about
 (sunday & Saturday)

What I have heard
 of the U. S. Paper Co
 they are a very
 important process as
 far as penetration
 is concerned.

P.S. I noted
 $6\frac{1}{4} \times 3\frac{3}{4}$. If
 I receive right in
 and $3\frac{13}{16}$ into $3\frac{3}{4}$.

The Waldorf-Astoria
New York.

May 3, 1906

Dear Mr. Schmitt,

I have ordered from

The American Co 50 lb

Super (Gorham) Muesli

They have after careful

thought this has appeared

to no defect. I suppose

to be a very severe

paper but a bulky

the contents of which

any other, but the
the same as in

the general defect
in the arches.

Dr. J. H. Brown
the following agent

the same as in

A. A. Brown and the

the same as in

the same as in

the same as in

the same as in

asked him if he can

see the study

light and some

in the country.

and have been better

than before but

the day that it is

very much better

the whole day. They had

some more and

some more

some more

The study I ordered

will have my about

(according to selection)

Cost of paper about
\$6⁰⁰ ~~have~~ ~~per~~
instead paper \$0.25

~~The~~ ~~letter~~ ~~reach~~
~~you~~ ~~in~~ ~~have~~ ~~place~~
~~for~~ ~~in~~ ~~the~~ ~~look~~
~~for~~ ~~any~~ ~~hesitation~~ ~~and~~
~~being~~ ~~only~~ ~~well~~ ~~and~~

I ~~am~~ ~~happy~~ ~~in~~
by right position, we
may find that we
can not ourselves

What I have heard
of the H. W. P. Paper Co.
they use a very
important process as
far as preservation
is concerned.
Many

~~of the~~ T. W. P.

P. W. P. I noticed paper

$6\frac{1}{4} \times 3\frac{3}{4}$. If

I receive 2 yds of

and $3\frac{13}{16}$ with $3\frac{3}{4}$.

not very well for chest
hope the printer
will be pretty well
through this week

Important the condenser
must be made so
that the edge of

this can be
out a full six
feet of an inch.

otherwise the box will
not go into the case
I am sure.

Yours

W. T. Allen

The Waldorf-Astoria
New York.

May 10, 1906

Dear Dr. Schell,

I had expected to
come out again but
but several things
it is impossible. I will be
here Saturday.
I am in the L. Bus.
Peter asking him L.
delivered the coal shed
according to the order
must be needed this

plan just as I left. Could they be making
The ~~business~~ business a proposition. It is
becoming interesting if it will not please
all I have about me particularly.
so far it has the The Province people agree
with her line of work to give me her
to her I am ~~instrumental~~ ^{instrumental} surely,
I am ~~of course~~ ^{of course}

I still am very pleased but just to enable
(That is what we are to make the
for his office and personal belongings
over the phone), I am ~~adjustments~~ ^{adjustments}. Before
thinks as he says I get the of them
but some wireless new machine I can

The Waldorf-Astoria
New York.

May 10, 1906

Dear Dr. Schell,

I have expected to

have seen you some time

but I have been

so busy that I have

been unable to

write you for some

time. I am sorry

to hear that you

are not well and

hope you will

plan ~~problem~~ as I left. Cr

The ~~business~~ business, a
very interesting, if
all I have about me
so far is that the
miller has been referred
to by another
person.

I shall be very pleased
(That is what we
from his office and
over the phone), I
thought as he surprised I got
but some wireless new

... as I left. Could they be making
business a proposition. It is
interesting, if it will all please
about the postcard.

The French people agree
to give me two for
Saturday,

... of course
very pleased. But just to enable
me to make the
necessary arrangements.

Before
supper I got one of these
releases. Now nothing I can

not only will go ahead
hope the printer
will be pretty well
through this week

Important The condenser
part is made so
that the edge of
the ~~condenser~~ is
out a full six
feet of an inch.
Otherwise the box will
not go into the case
I am here

Yours

W. T. Allen

Dear
Am
but
at in
here
Am
Palm
delio
accord
must

In heating the compound
 to 270°C we can see
 to expect all water
 hence the dry process
 is our objective. Well
 not be necessary, when
 the rolls are thoroughly
 prepared as could
 be seen in the
 laboratory and was
 I propose to use some
 of the small copper tubes
 for the purpose. Please
 take this experiment into
 consideration of this
 since I wish

P.S. Dr. Warr has written y-
 see that you comply with his
 The Waldorf-Astoria
 New York.
 have ordered
 more paint May 11, 1906
 Dear Dr. Scherff,
 Your letter just
 received.
 As I have told you
 all the
 things I am doing
 as its boiling point
 is above the melting
 point of lead. The
 metal just

enclosed

360° C whereas Paraffin is proposed to modify
boils at 370° C. The heat transfer
is different with Petroleum & wax which will
it boils at 108° C. overcome this difficulty
we can in our apparatus and save fuel but
heat the paraffin with of trouble. This heat
has but not much effect on the wax. The right
Paraffin is not a good wood for rolls in
we would use steel paraffin. This should
at a pressure of 150 lb be done outside
- would come out help of building. The
way to the building rolls should be put
of Paraffin.
In view of this I. 2. upright position

I.S. Dr. Wait has written y-

See that you comply with his

The Waldorf-Astoria

New York.

Have ordered

more present

May 11, 1906

Dear Dr. Scherff,

Yours letter just

received.

As I have had you

depressed evening

both of my

point of view. The

metal present

at

pen case

160° C whereas Peraph
boils at 330° C. It
is different with Russian
it boils at 108° C.
We can in our apparatus and
heat the paper with
heat but the
Peraphane is
we would use steam
at a pressure of 150 lb
we would come out half
way to the boiling
of Peraphane.
In view of this I am

... Perhaps propose to modify
C. H.

Business & way which will
108°C

appears to overcome this difficulty
and save great deal

of trouble. This has
not been the case

and the rolls are
clean

150 lb per ton. This should
be done outside

of building. The
rolls should be put

in a upright position

In heating the compound P.S.
to 270°C we are sure See
to expel all water from
hence the dry process more
is our experience and less
the can be necessary. When
the rolls are thoroughly
~~expelled~~ as could
~~be seen~~

the compound was used
I propose to use some
of the small copper tubes as
for the purpose. Please to
take this experiment into
consideration and report of the
same to Tech. Mel

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK.
THE BELLEVUE-STRATFORD, PHILADELPHIA.

The Waldorf-Astoria,

New York May 14 1906

Dear Mr. Schmitt,

I was of the opinion that the explosion in the
Long Island Sound. I am sure that the explosion was
the shock was very strong in the fort. I am sure
that my house will not be subjected
after the such tests. I am sure that the explosion was
the end with shells in the air and a
quite safe against breaking through. I
expect to bring out a model soon.
So that we can see it. We shall simply
show the layers of the lake bed. I am sure

NEW YORK CABLE ADDRESS "WALDORF NEW YORK"
PHILADELPHIA CABLE ADDRESS "BELLEVUE PHILADELPHIA"



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

New York May 14 1906

Dear Mr. Schmitt,

I was of the explosion in Bridge
~~land~~ which ~~showed~~ ~~down~~ ~~from~~
~~along~~ ~~land~~ ~~showing~~ ~~from~~ ~~the~~ ~~land~~
the shot was very strong in Ball port.
Hope my horse will not be subjected
after such tests.
Have found a simple way of winding
the cord with shelles & that is all a
little safe against breaking through. I
expect to bring out a model soon.
So that we can work in the shell simply
without any danger of the horse dying. Am
Yours

Carl, yesterday I (had)
 from a copy under by
 name. Had made capital
 I commercial. Says he
 he all the money necessary
 though that you have been
 able to get some help
 The old job that should
 be provided at any cost
 There is a possibility that
 the old night come out
 he get an idea of
 the place so that he may
 have a refund later. He had
 been so last night. He had to
 Carl Sunday, worth 22. I
 had \$100 to last night.

The advertisement will be by Fred
 and Fred. He will be in N.Y. by
 Tuesday. *James & Paul*
The Waldorf-Astoria
 New York.

May 11, 1906

Dear Dr. Schief,
 I expected to go out
 tomorrow Friday but
 it seems better to
 wait until Saturday
 morning when I shall
 be able to take
 along the new machine
 (which I had) with me
 going to my mother's
 Sunday as per usual

fully adopted. I
 brought the matter before the
 Council one or two years
 or before last winter.
 will advance the work
 of your will prepare
 the paragraph paper as
 before. Between the City
 and any other thing
 necessary for working.
 I am not quite sure about
 the title of your work.
 depends on the conditions
 will decide by the time

I got them Saturday.
The papers are full
of the article just as
I expected. We don't
yet know yet whether
the Supreme Court will
grant change of venue.
It will probably be
decided by Saturday.
Have what seems a
good news. Mr. Sherwood
wants to take up
my mother's case
and this type of

l(c-a) 75 The restaurant will be by friend
and food. He will be in N.Y. by
Friday
The Waldorf-Astoria
New York.

May 11, 1906

Dear Dr. Schief,

I expected to go out
this morning Friday but
it seems better to
wait until Saturday
morning when I shall
be able to take
along the new machine
(wonderful) with me
on my morning walk
Saturday as per usual

himself advised. I
bring the matter before the
Council one or two times
or before the board of
the school. The work
of the school will require
the preparation of
the curriculum. The
any other thing
necessary for reading. It
I am not quite sure about
the date of the first
depends on the curriculum.
will decide by the time
I will

I got them Saturday.

The papers are free
of the Anti-Slavery

Association. We don't

but have yet the

the Supreme Court will

prevent change of venue.

It was probably the

decided Saturday.

Have what seem

good news. Mr. Sherwood

would be taken up

by the other members

and in this type of

Coil, purchased at 1.00
from a Chicago dealer by
name. Moderate capital
and commercial. Says he
has all the money necessary. He
thinks that you have been
able to find some help.
The only place there should
be for that is any one.
There is a possibility that
the old light come out
also for an idea of
the place so that he may
have a good idea. He has
been so long ago. He has
been Sunday, 1822. I
have 100 to last night.

very good. To-morrow
 expect to order the paper
 envelopes. I can
 be sure how I can
 find the new name on
 the envelopes as the
 change takes effect
 July 1.

Many

Yours

The Waldorf-Astoria
 New York.

May 20, 1906.

Dear Dr. Scherff,
 I think you will
 find the short circuit
 in the cord we are
 using for as I can see
 it can not be in
 the motor.
 Perhaps let me
 telephone to the
 electrician.

be come to

pressure at the end of the ditch,
of the ~~high~~ ^{high} ~~pressure~~ ^{pressure} near the bottom is very low should be used
small. The pipe will very light or
be checked up somewhere. I hope you
or else the valve will be able to do
opening in the it so that I may
travel in the small, when a last the
be used to will connect I connect out.
The man to the pump. No news of the
(200 lbs). Tell him. No news of the
to do this before next. But I
the situation when can find proof of letter -
be come to - summer close lead. The course.

The Waldorf-Astoria
New York.

May 20, 1906.

Dear Mr. Scherff,

I think you will
have the hotel arranged
to the end of the road
as far as I can see
it can not be in
the market.

Yours truly
C. W. M.

George W. M.

[illegible]

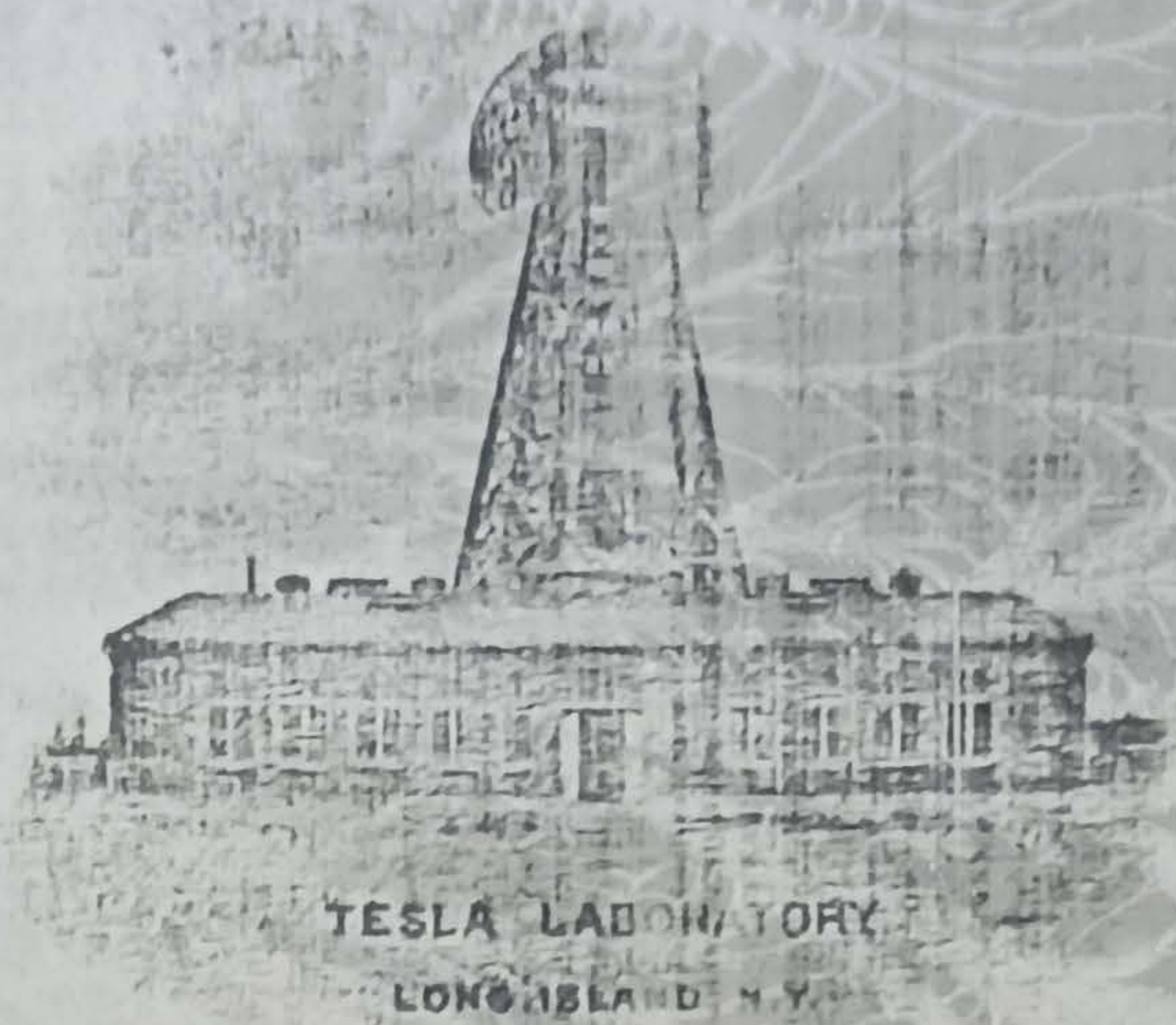
[illegible]

very good. To some
 extent he will be
 a candidate. I can
 be in line I can
 find the new name
 the candidate as the
 change takes place
 I am

[unclear]

[unclear]

has come to a decision about



New York May 28, 1906

Dear Mr. Scherff

This is the first steel received
from the McIntosh T.B. Co. The cut
seems to be fairly good. At any
rate this change of stationery is
agreeable to me.

Dr. Sherwood writes that subscrip-
tions toward manufacture of the
transformers are coming in all
right.

The Pease people will furnish

run hundred secondary spools by
to-morrow so that you may expect
them Thursday next.

I have now fully developed a
scheme for winding in simple
helical steel. I think I can
not improve. The new winding
will not break down I am
sure and my stupid boy can
be used to do the work.

To-morrow I shall be again
for my friend R. but day after
I will be at home hoping that
you may have the paper for the
Condensers on hand.

Yours

N. Tesla

7 had several conversations
over the phone with an
and has promised to
see he is soon as
possible but up to
present nothing has
materialized. It is perfectly
clear to me that if I
am to get capital I
can only get it from
some fellow who has his
eyes on the millions.
Hoping for the best
Sincerely yours

N. Tilden

The Waldorf-Astoria
New York.

Nov. 20. 1907

My dear Mr. Scharff,

I have pleasure in
acknowledging the documents
I received.

I am sure Mr. Allen
will consider him

an ideal corporation lawyer.

As to bringing books

up to date it may
perhaps be necessary.

I hope you will be
able to get them

family are well. August yes because it seems
the business is being almost impossible to
run. There are simply very few money
and. The Int. there.
unfamiliar lines. I can not
understand it all how
Americans who are so
desiring and reckless in
other respects can get
scared to such a degree which I can
by ship population when to except for them
is really great. I have present. If I had
studied it out in all just a little capital
details and feel I would be wrong about
sure that it will prove something by plan.
me out of the hole. As my friend T.J.A. has
how I do not seem.

The Waldorf-Astoria
New York.

Nov. 20. 1907

My dear Mr. Scherff

I have pleasure in
document,) received.

Tell Mr. McLean that

I consider him an

ideal corporation lawyer.

As to bringing books

up to date is my

perhaps not necessary.

I hope you will be

family are well. August
the business is king
now. There are simply
awful lines. I can not
understand at all how
Americans who are so
daring and reckless in
other respects can get
scared to such a degree.

By ship propulsion when
is really great. I have
studied it out in the
details and feel
sure that it will put
me out of the hole. I
know I do not mean.

anything yes because it seems
is being almost impossible to
simply turn any money it
can not do. The Int. there.
how service is by best
so customer and they
are certainly interested
for but when conditions
degrade which I am unable
when to except for them
I have present. If I had
the just a little capital
feel I would be very about
pull something by plant.
see. By fund T.I.A. has

Had several conversations
over the phone with him
and has promised to
see me as soon as
possible but up to
present nothing has
materialized. It is perfectly
clear to me that if I
am to get capital I
can only get it from
some fellow who has not
less than 100 millions.
Awaiting for the best

Sincerely yours

N. Tardieu

The Waldorf-Astoria
New York.

Dec. 12 1907

Dear L. Schmitt,

Replying to your letter
just received your testimony
is of course to the point
I shall send you copy
when I meet you next as
I do not know the address
of Dr. Mac Allen.

I have made a little
progress, and hope that
myself, will be

I am satisfied that
 he has the same high
 opinion of me. He entertained
 them we started. That
 pieces are made - I
 was really thinking the
 opposite.

2. Another letter from a
Lodge in which it is
stated that the same
in the volume is by
inventor. It is curious
that by friends never

Best by friends have
 personal and communication
 Sincerely yours

The Waldorf-Astoria
New York.

Dec. 12 1907

Dear Mr. Schmitt,

Replying to your letter
just received your testimony
is of course to the point.
I shall send you copy
when I meet you next as
I do not know the address
of Mr. Mac Allen.
I have seen Mr. Allen
person and will be
able to tell you

...d. Two parties seem
to be well impressed with
3 principles scheme and
it looks as though the

of them (Int. H. H.) will
furnish the substance for
a practical experiment

Mr. Crawford will be
and self next week
I have reason to
believe that he feels better
now and will let me
soon with the enclosed
I called up H. H. ...
by L. H. I from his summer

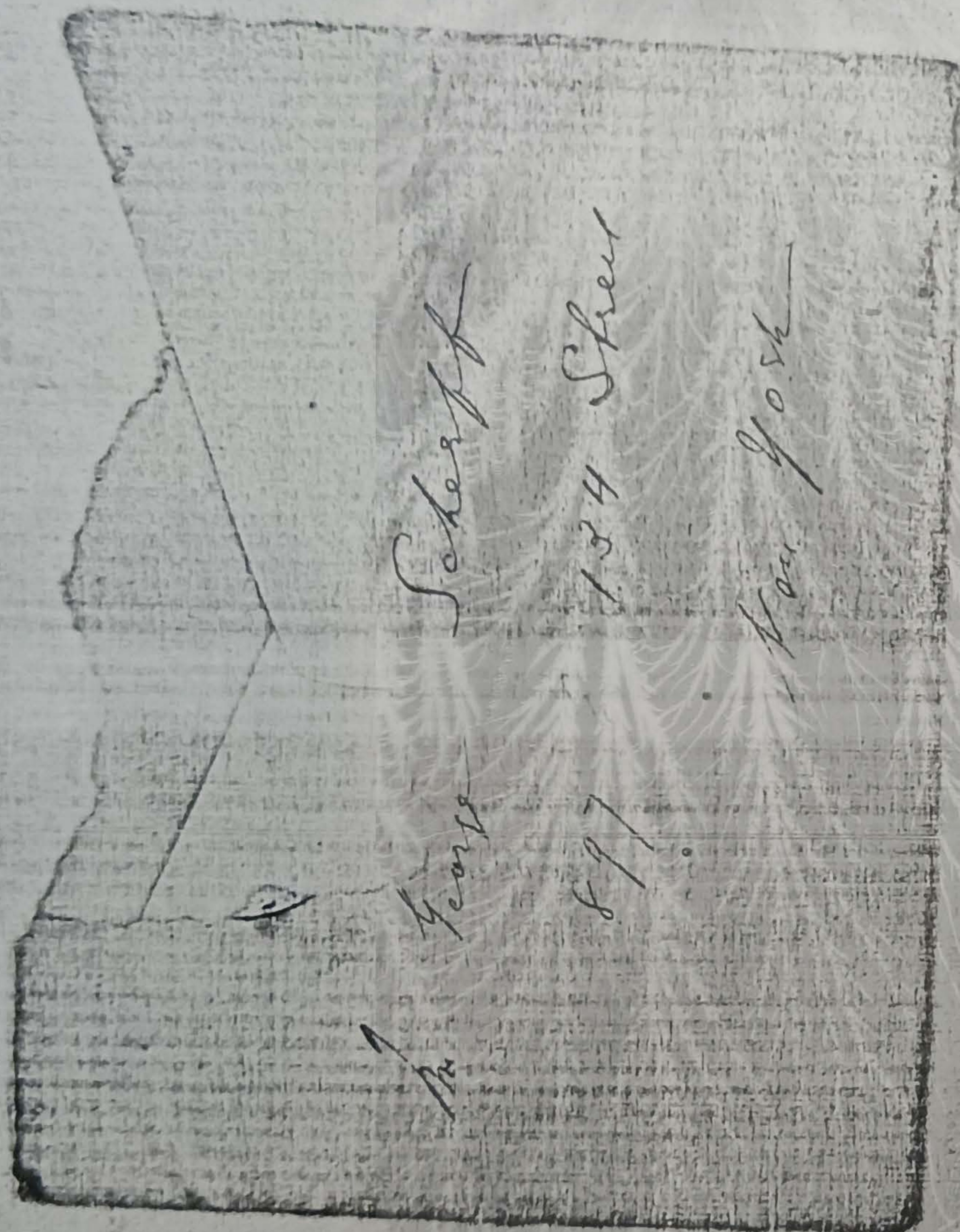
has seen
with
even
the
(I) will
me for
moment
be
week
to be
both
he
ambrose
In. secret
summer

I am satisfied that
he. He has the same high
opinion of me. He entertained
them we started. That
fleeces are hard to
was really thinking the
opposite.

He, however, sent me a
letter from a electrician
Lodge in which it is
stated that the rare is
in the wireless is by
invention. It is common
that by friends have
personal and communications.

Sincerely yours





The Waldorf Astoria
New York.

March 23 1908

Dear Mr. Scherff,

We signed the day agreement
relating to T. electro. As you know
but there was a delay in the
N. York proposition. I have
no doubt that the business
is common.

few days
I am hard at work on
the little instrument and hope
to have it complete sometime
next week when the good work
can begin.

S. S.

I suppose same is on
the way now.

Sincerely

N. T. Hall

The Halsdorf-Astoria
New York.

March 23 1908

Dear Dr. Schacht,

We signed the day agreement
relating to T. & electro. Co.
but there was a delay in the
K. & K. Co. proposition. I have
no doubt that the business

Смешан

few days

I am hard at work now
 the little instrument and hope
 to have it complete sometimes
 near sick when the good work
 can begin

15.

Finch

I suppose Saxe is on
the warpath now -

✓ Fall

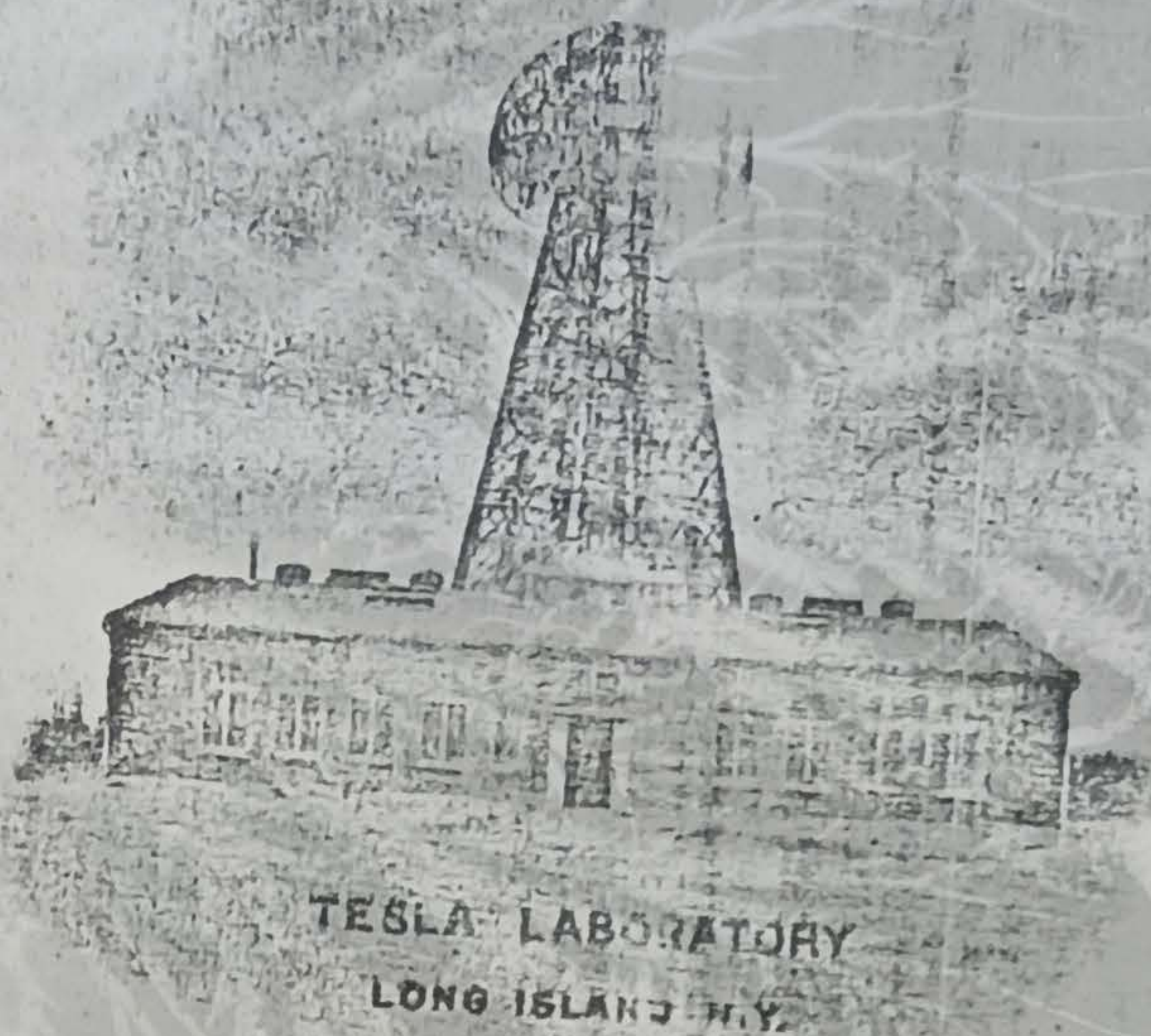
George

897

Scherff

134 Street

New York



New York, July 1, 1908.

Mr. George Scherff,
C/o Union Sulphur Company,
82 Beaver Street, City.

My dear Mr. Scherff:--

Thanks for the trouble you have taken in attending to the
company matter.

As to fans or anything else you may need, I shall be
glad if you will help yourself as though it were your own. You
only need to write Mr. Hawkins and select what you want.

Sincerely yours,

N. Tesla



165 Broadway, New York,
February 19, 1909.

George Scherff, Esq.
Union Sulphur Company,
82 Beaver Street, City.

My dear Mr. Scherff:--

I am sorry to learn from your letter just received, of the illness in your family, but I hope that nothing serious will develop.

Your faith is certainly firm when you say that you expected confidently the payment. I had the idea that your advancement in the company was such as to free you of all troubles.

My progress is slow but sure. We have demonstrated that my water turbine is of very high efficiency, having shown 96% in a recent trial. The steam and gas turbine have both been practically carried out and promise to be revolutionary improvements. We are just completing a blower on the new principle driven by one of my induction motors. This will be a commercial machine. I am now at work on new designs of an automobile, locomotive and lathe, in which these inventions of mine are embodied and which cannot help prove a colossal success. The only trouble is where and how to get the cash, but it cannot last very long before my money will come in a torrent, and then you can call on me for anything you like.

Yours sincerely,

N. Tesla



165 Broadway, New York,
February 19, 1909.

George Scherff, Esq.
Union Sulphur Company,
82 Beaver Street, City.

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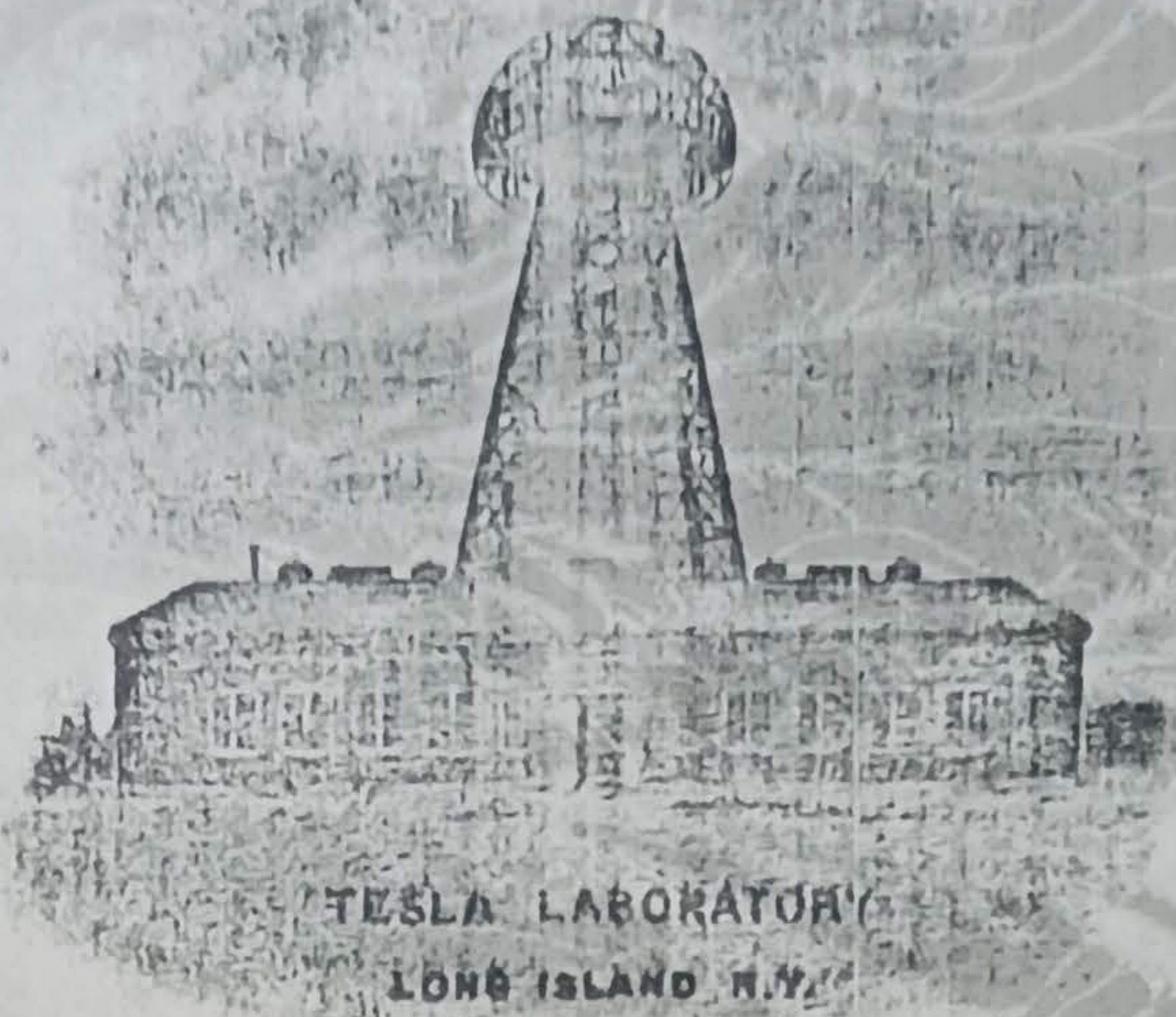
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Yours sincerely,

N. Tesla

George Scherff
Union Sulphur Company,
82 Beaver Street,



165 Broadway, New York,

Nov. 26th, 1909.

Dear Mr. Scherff:

Thanks for your letter. I believe indeed that I have overcome all resistance and that from now on, progress will be steady. In a few days, you may hear of developments which I mentioned to you a few days ago.

I will be much obliged to you if you will advise the Hawkineses in regard to the steps necessary towards fixing papers on their behalf. I have the kindest feelings for them and want to have everything right and satisfactory.

If you have not seen the enclosed, it will interest you.

Yours sincerely,

N. Tesla

George Scherff, Esq.,

82 Beaver St., New York.



10 Broadway, New York,
Jan 21st, 1910.

My Dear Mr. Scherff: -

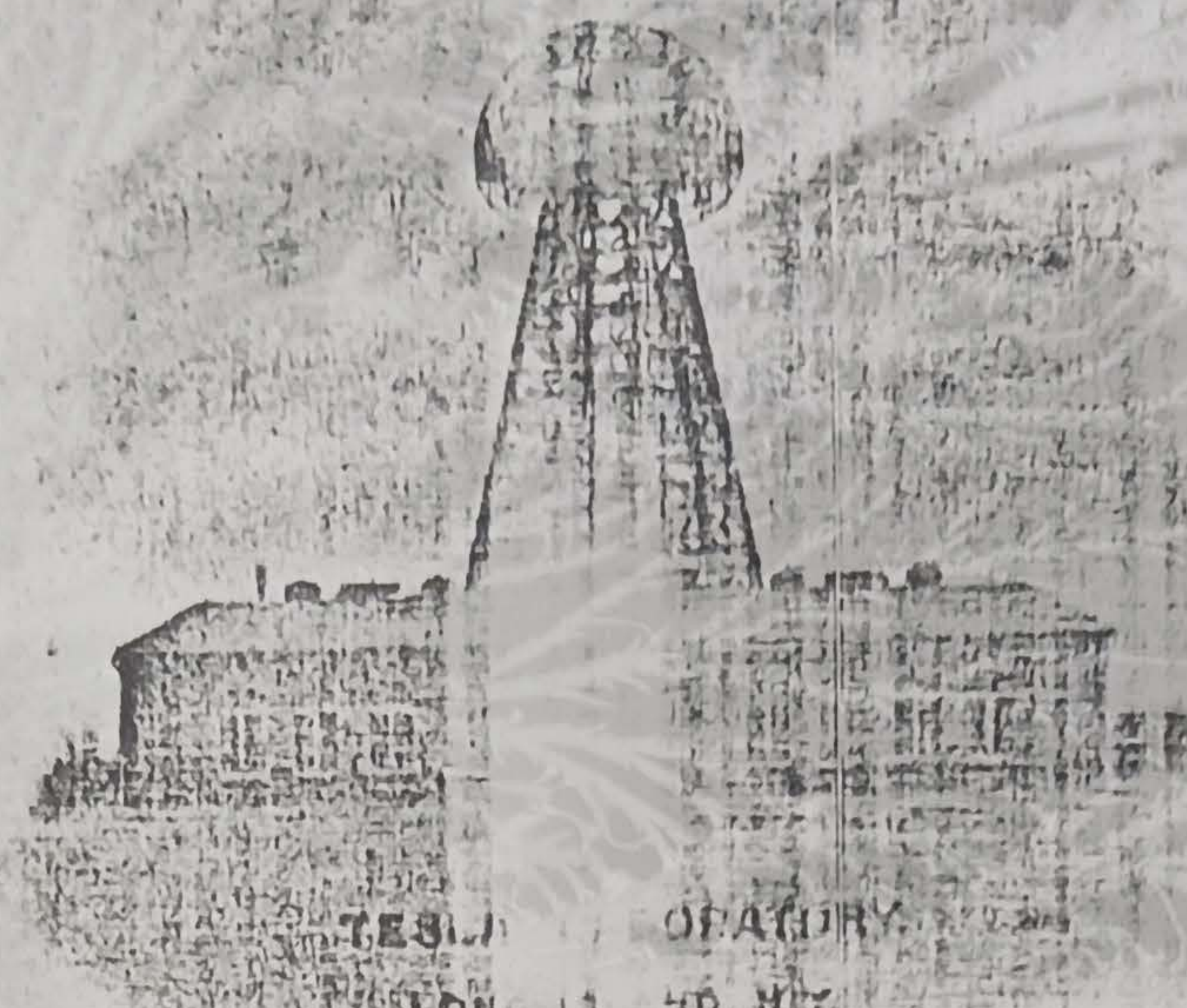
I was unable to reply before this to your letter as I had to go out to Bridgeport where we have some important work going on. We have just undertaken to furnish one of my turbo-pumps of 450 horse power for a pumping plant near Buffalo. In the near future, I expect to give myself the pleasure of taking you out and showing you some of my machines in operation.

I do not think that there is any possibility of you ever sustaining a loss whether you had any documentary evidence or not. At least, I understand that claims such as yours would receive preference over any others. I am forwarding you, under enclosure, documents and would be obliged to you if you will let me know the number of shares which have been pledged in each case. I have no record before me at this writing but you probably must have it.

Yours sincerely,

W. Teak

John Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.



10 Broadway, New York,
Jan 31st, 1910.

My Dear Mr. Scherff: -

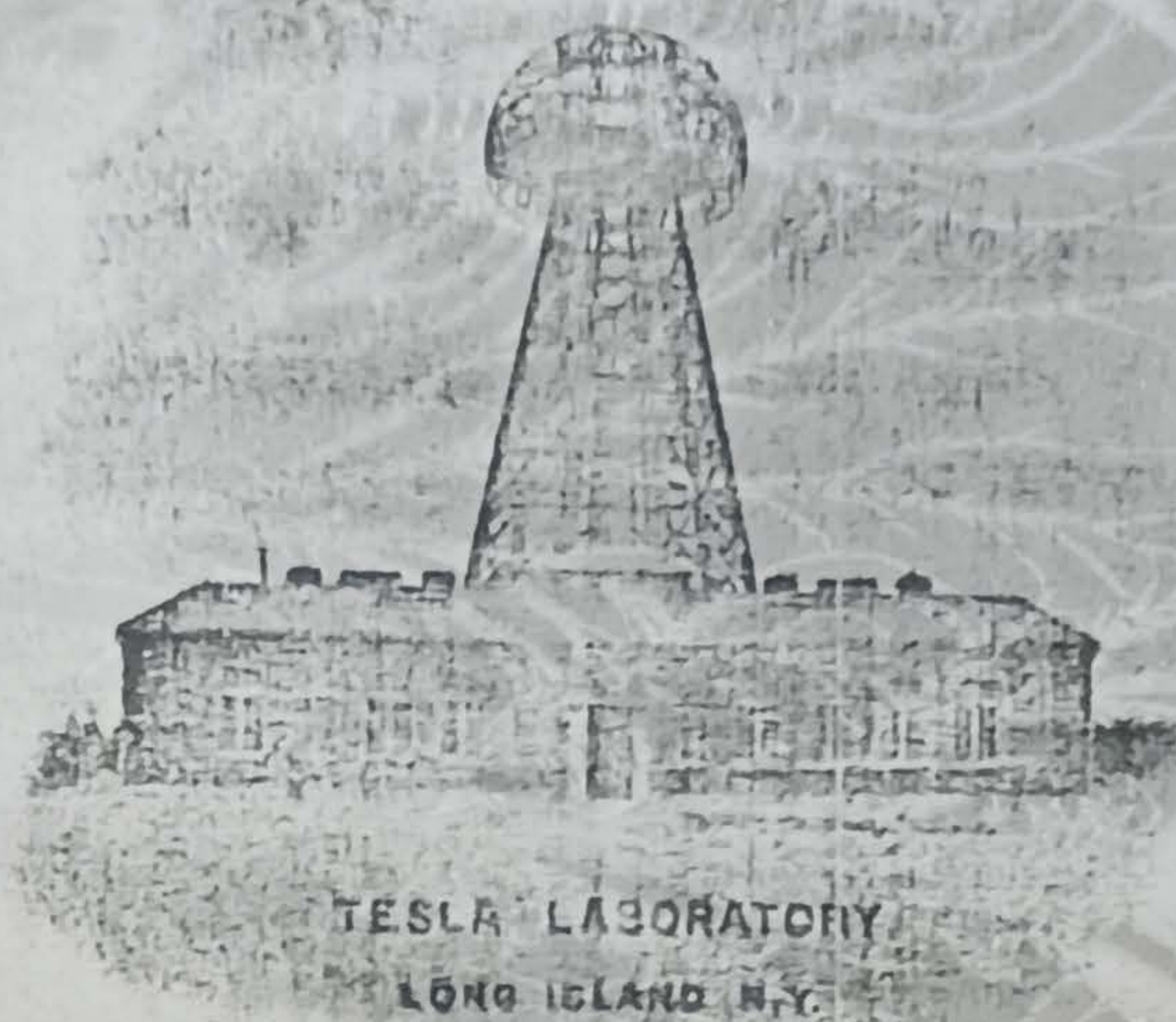
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Yours sincerely,

W. T. Scherff

John Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.



165 Broadway, New York,
April 1st, 1910.

My Dear Mr. Scherff;

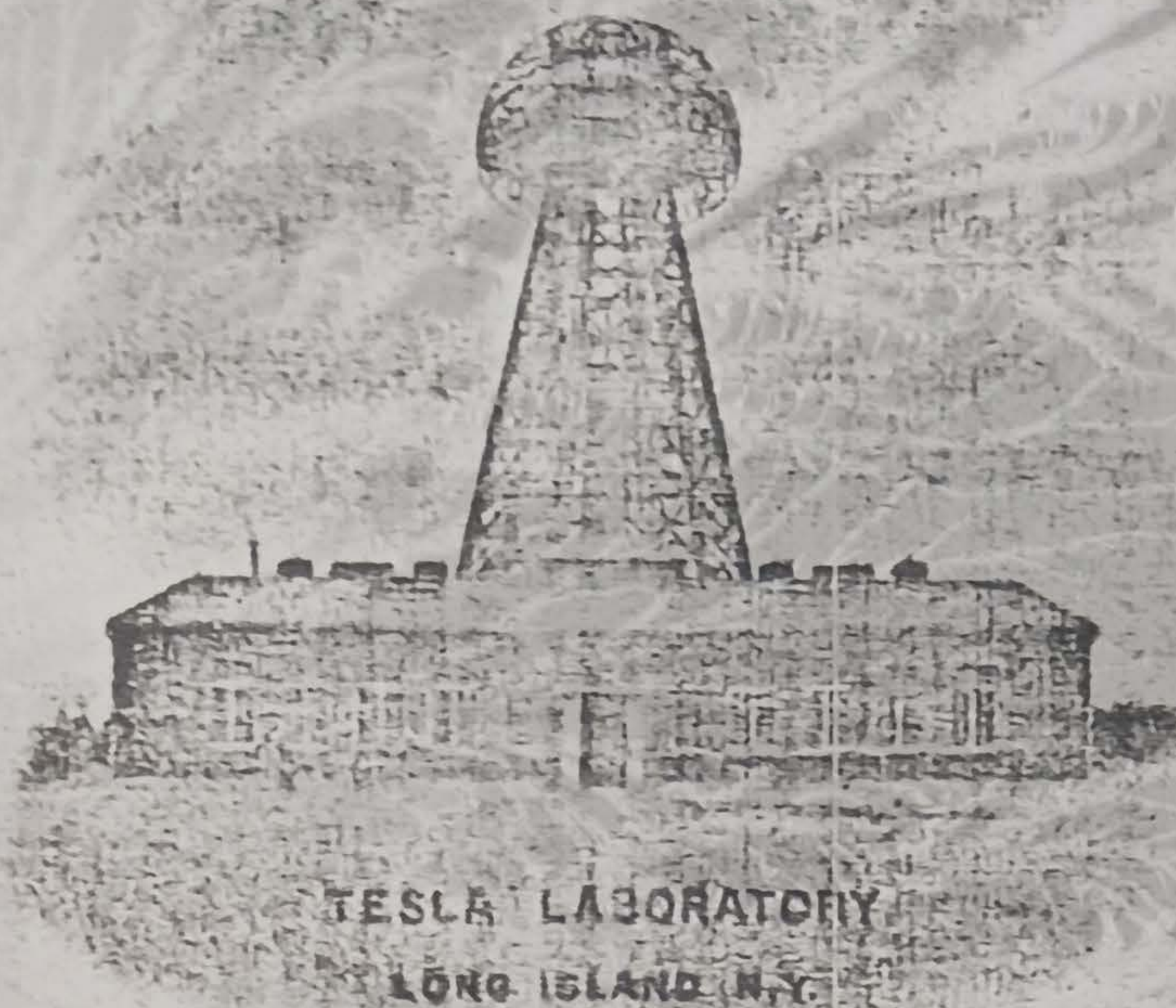
I have just returned from Bridgeport, where I tested my little turbine in the presence of several experts. The machine, to which I have referred in my previous correspondence, developed 93 horse power, which was considered a wonderful performance.

While I am satisfied that the evil spirit will not long bother you, I am afraid that on April 1st, he will have his way.

Yours very sincerely,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
83 Beaver St., New York.



165 Broadway, New York,
April 1st, 1910.

My Dear Mr. Scherff;

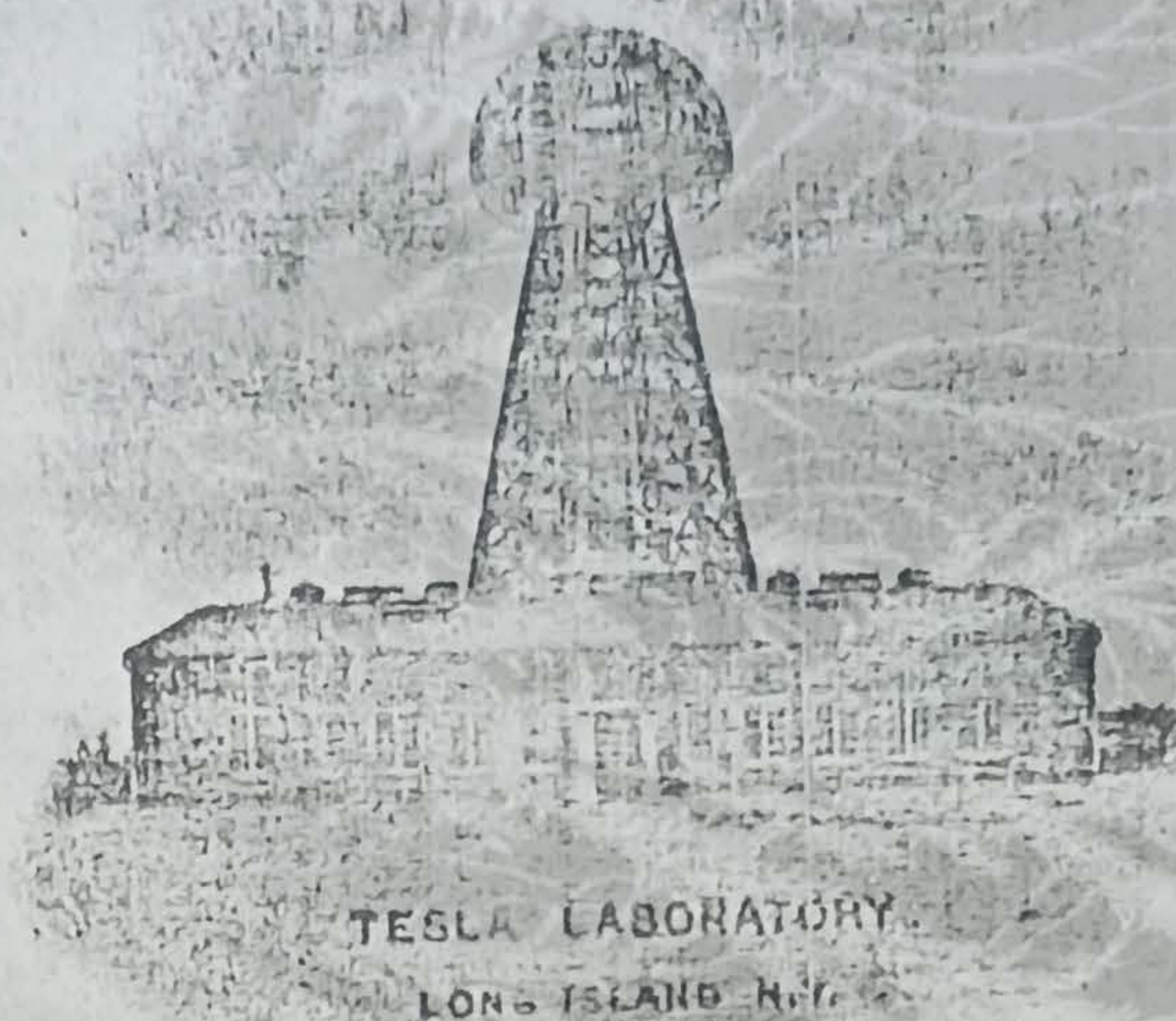
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Yours very sincerely,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
83 Beaver St., New York.



165 Broadway, New York,
June 6th, 1910.

My Dear Mr. Scherff;

The Journal of Commerce has been pressing me for a personal sketch which they want to publish. I have reluctantly promised to furnish it and would like you to help me out. I think that something like the one you wrote for "WHO'S WHO" a trifle enlarged to meet their requirements for space would do. I would be much obliged to you if you would do it at an early date.

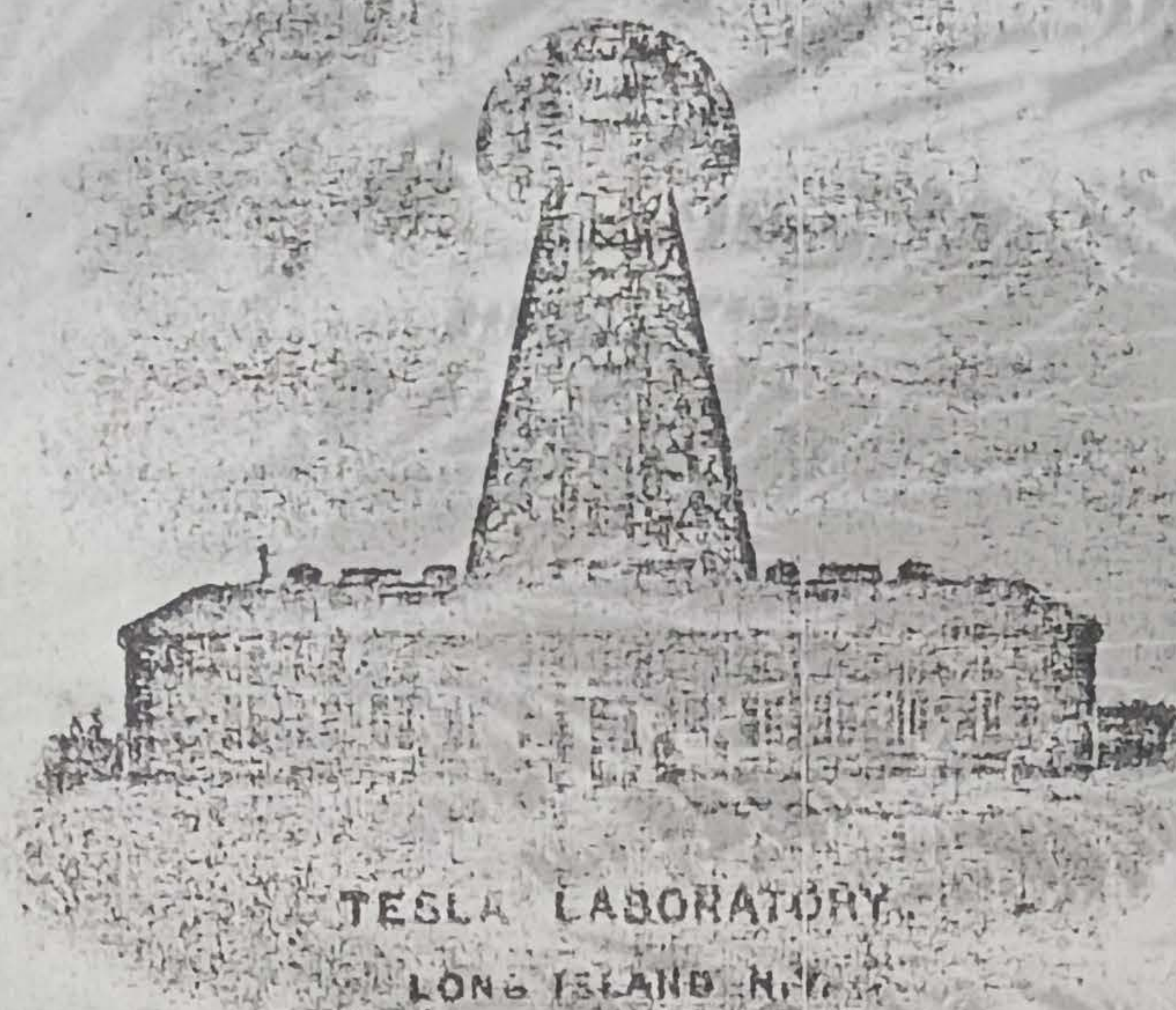
Since our last correspondence I have heard nothing from you and anticipate that Mr. Snider has not yet returned.

It will interest you to know that we have managed to put together the turbo-pump on Saturday but it is not yet in definite shape. However, it will be in running condition before the end of this week and I trust that my expectations will be realized.

Sincerely yours,

N. Tesla

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Union Sulphur Co.,
82 Beaver St., New York.



165 Broadway, New York,
June 6th, 1910.

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Sincerely yours,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.



10 May, New York,
April 20, 1910.

MY Dear Mr. Scherff:-

I have duly received your letter of April 6th including a copy of proposed agreement with Mr. Lowenstein which bears evidence of your thoughtfulness and thorough knowledge of the conditions. On the whole, I think though that an agreement on these lines will not permit us to favor him without hurting in some way the other interests of the Company. In view of this, I shall be obliged to you if you will make an effort to devise some other form of contract which will obviate this difficulty. I shall think of the subject myself although I have little hope of arriving at a good conclusion.

Yours sincerely,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
83 Beaver St., New York.

10 May, New York,
April, 1910.

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Yours sincerely,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
83 Beaver St., New York.

165 Broadway, New York,
June 29th, 1910.

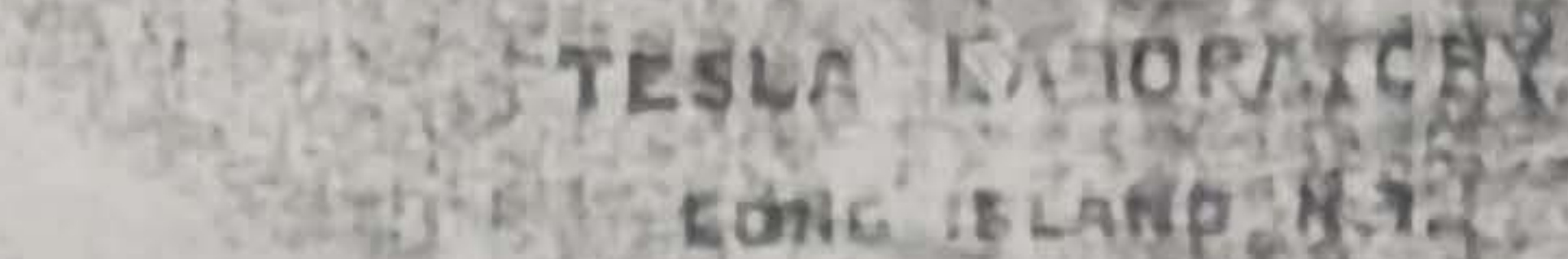
My Dear Mr. Scherff;

You called me up yesterday at an inopportune moment, otherwise I would have set aside other engagements to confer with you.

In order to save you unnecessary trouble, I will supplement reluctantly, of course, a few data to the article which you have written some years ago for the Hamersly publication. It would only been necessary to change the wording somewhat, leave out some unimportant remarks and bring it up to date.

For reasons which you well appreciate, I would suggest that you mention the Elliott Cresson Gold Medal which was awarded me in recognition of the work presented to the Franklin Institute and National Electric Light Association in 1893, in which wireless transmission was one of the most important chapters. Another very important work which should be mentioned are my discoveries of novel radiations or emanations, which I published in a series of papers in the Electrical Review, New York, from 1896 to 1898 and which long after were identified with radium. As you well remember, I announced all the salient phenomena and gave the theory two or three years before anybody believed in the possibility until Madam Currie announced her discovery in which she virtually repeated what I had published except that she attributed the actions to a new element while I pronounced them as general.

In referring to my participation in Scientific Societies, Institutions and Academies, as honorary or regular member, it would be well to state that I am a life member of the British Association and a member of the Royal Institution, as these are probably the most renowned scientific technical institutions.



TESLA MEMORIAL HALL
LONG ISLAND CITY, N. Y.

#2
1/2

George Scherff, Esq.,
June 29th, 1910.

In mentioning degrees, you will, of course, recall that I am an M.A. of Yale, an L.L.D. of Columbia and, among other things, a Doctor of Science of the Polytechnic School of Vienna. This distinction was conferred upon me in acknowledgement of my discoveries of the principles of wireless transmission and power.

The most difficult thing probably will be to bring the article up to date by reference to my activities since that article was published. You will know that several Companies have since been formed for commercial exploitation of various inventions. Among these unquestionably the most important is my discovery of a new mechanical principle which I have embodied in a great variety of machines such as reversible gas and steam turbines, pumps, blowers and air compressors, water turbines, mechanical transformers and transmitters of power, hot air engines, etc. This principle, among other things, enables the production of prime movers which can develop ten horse power for each pound of weight, if not more. By their application to aerial navigation, and propulsion of vessels on water, high speeds are practicable, and the results so far obtained are very promising.

At the proper place, you might also fittingly remark, since it is true, that I have a number of discoveries in the electrical field which have not as yet been announced but which I believe to be more important than any electrical work that I have so far done.

I am very sorry that I am compelled to make such statements on paper but I do so simply because I



#3

George Scherff, Esq.,
June 29th, 1910.

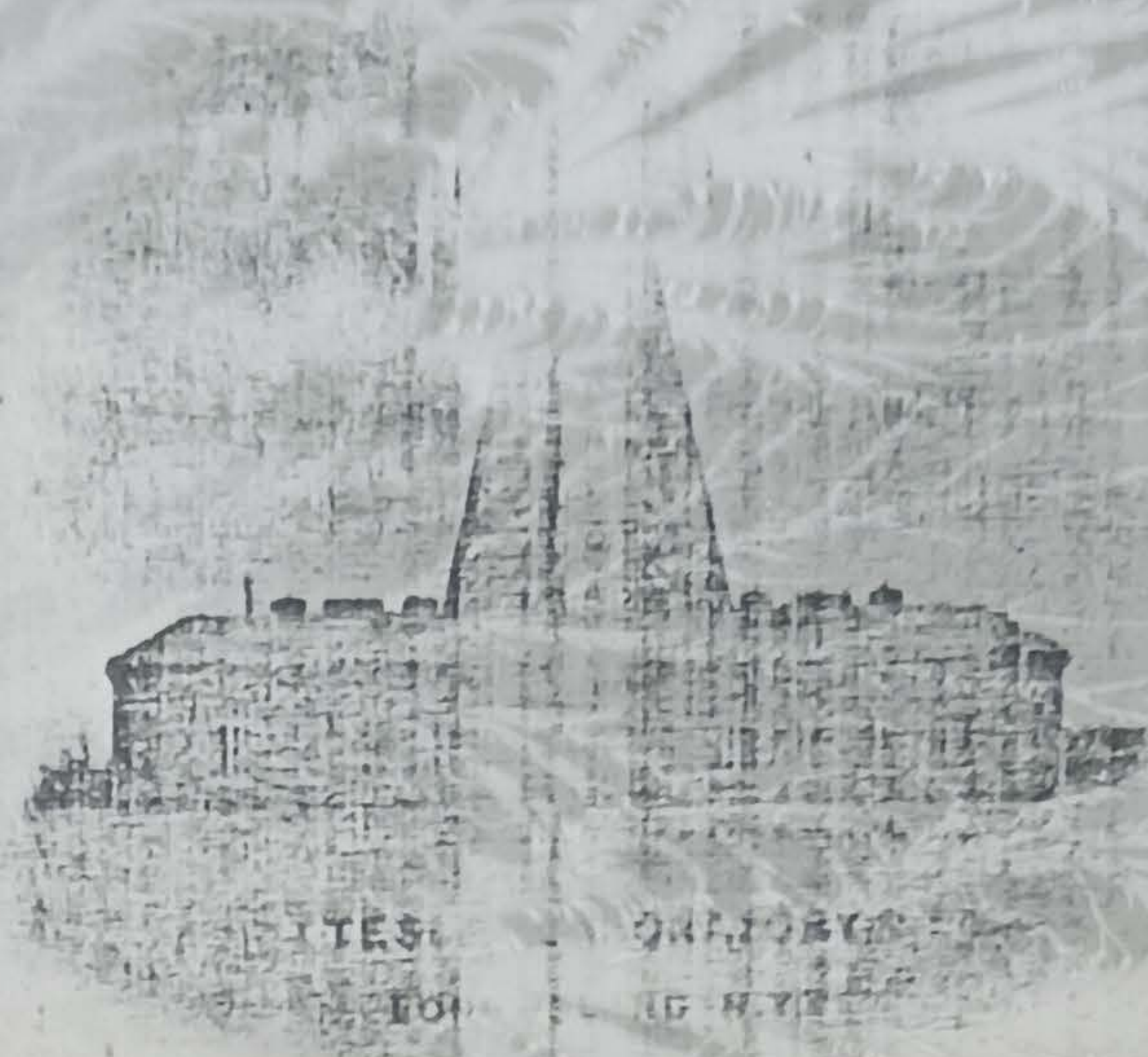
know that it must be told and in my desire to spare
you the trouble of coming here.

I am expecting to make some tests of the
large turbine tomorrow and hope that they will
be satisfactory as much depends on the issue.

Yours very truly,

N. Tesla

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Union Sulphur Co.,
82 Beaver St., New York.



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June 29th, 1910.

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#3

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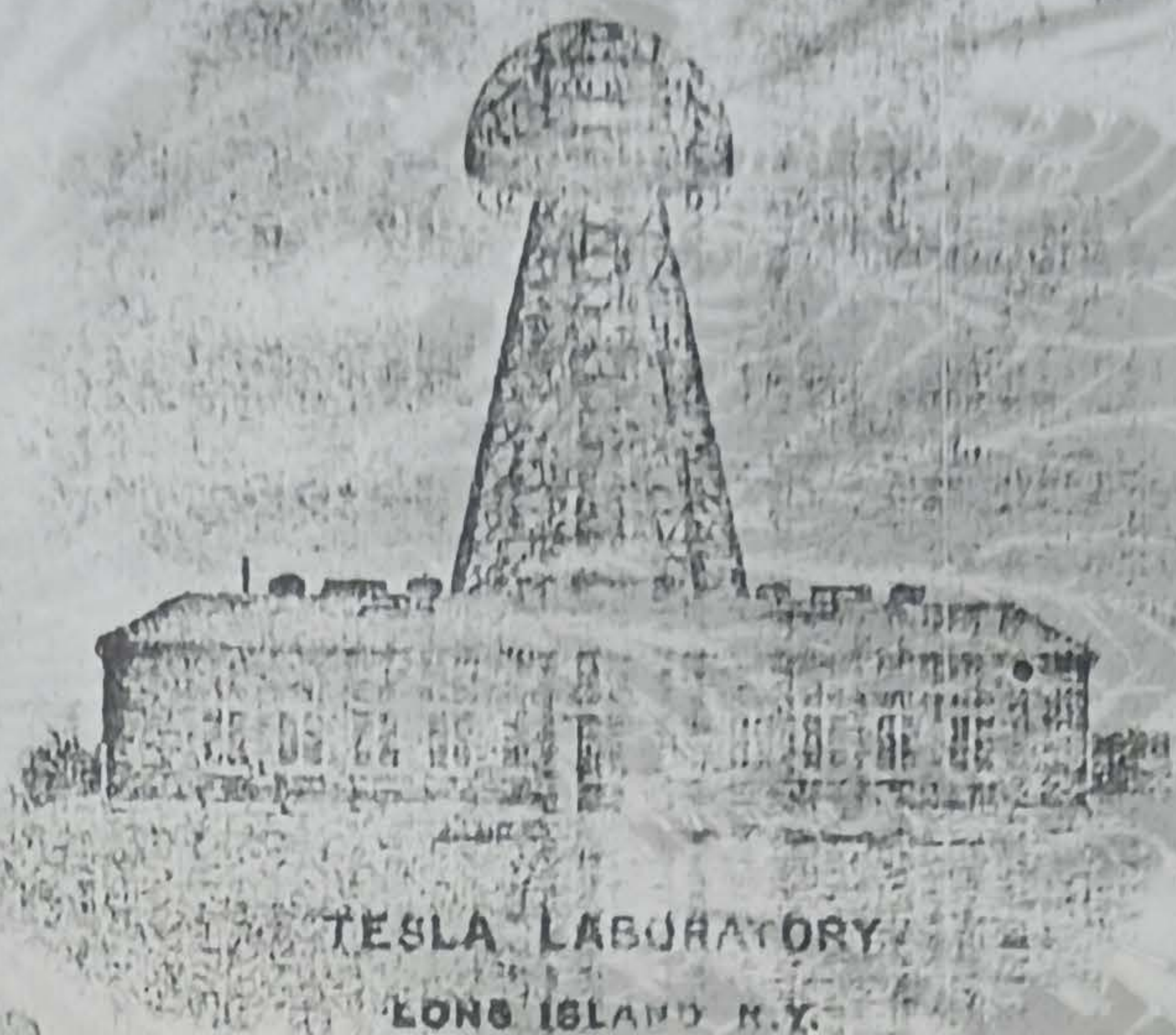
know that it must be told and in my desire to spare
you the trouble of coming here.

I am expecting to make some tests of the
large turbine tomorrow and hope that they will
be satisfactory as much depends on the issue.

Yours very truly,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.



202 Metropolitan Tower,
September 7th, 1910.

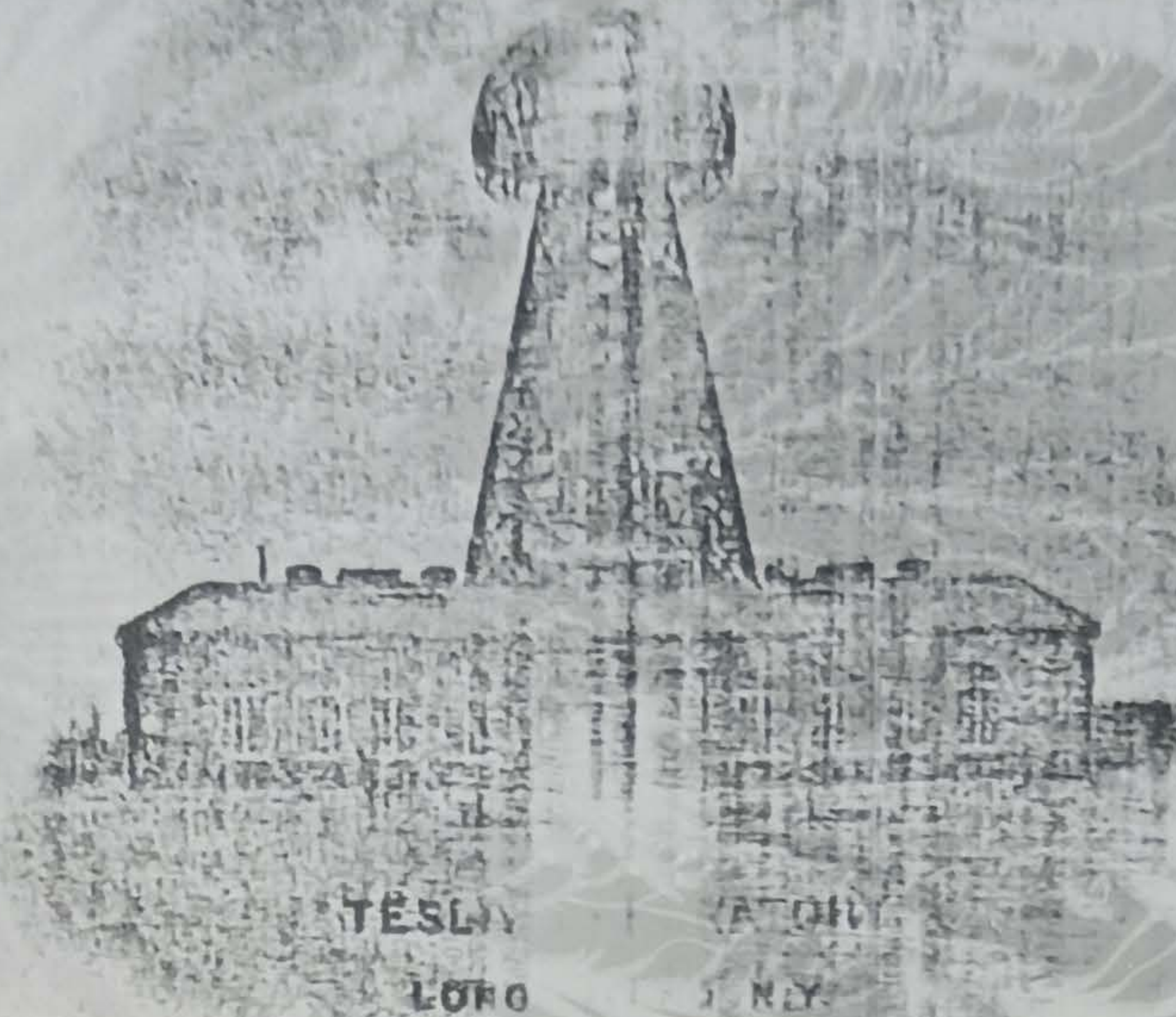
My Dear Mr. Scherff;

If it is convenient for you
some day on your way up town, I would like to see
you in my new offices at Room 202 Metropolitan
Tower, as I have some things to tell you.

Sincerely yours,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.



161 Broadway, New York,
July 11th, 1910.

My Dear Mr. Scherff;

We made a test with the turbo-pump Saturday last and developed an impressive little Niagara, 4' wide and 7" deep at less than half the normal speed. The quantity pumped was about 2600 gallons per minute and the height 80'. The pump part is evidently in good order but, I have yet to make some little improvements on the turbine before it is all complete.

Yours sincerely,

N. Tesla

George Scherff, Esq.,
Union Sulphur Co.,
82 Beaver St., New York.

NEW YORK CABLE ADDRESS: WILDER, NEW YORK
PHILADELPHIA CABLE ADDRESS: BELLEVUE, PHILADELPHIA



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

New York, June 9, 1915

Place N.Y.

Mr. B. H. H.

I have the pleasure in my machine just received. It is
possible to use some of my ideas. The author ignores however
some of the details which are of particular advantage when

it is possible to use two of my contributions which are not
in the present work but are spoiled by typographical
errors.

I can not comply with your request as yet but
will be in sight. The stock of my Company will be very
short while I am quite sure. It is possible that I
will be able to surprise in a little while. As to the
interest you think best.

Yours sincerely

N. Tesla

unmistakable interest
in my foundation. I
will let you know daily.

NEW YORK CABLE ADDRESS: WALDORF, NEW YORK
 PHILADELPHIA CABLE ADDRESS: BELLEVUE, PHILADELPHIA



THE WALDORF



THE BELLEVUE-STRATFORD



THE ASTORIA

THE WALDORF-ASTORIA, NEW YORK
 THE BELLEVUE-STRATFORD, PHILADELPHIA

The Waldorf-Astoria,

New York, June 9 1915

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two of my contributions which were well
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I can not comply with your request as yet but
 am in sight. The stock of my company will be very
 while I am quite sure. It is possible that I
 surprise in a little while. As to the
 you think best.

Yours sincerely

A. Tesla

unwearable interest
 in my foundation. I
 letters almost daily.

But finances worry me a little, the
expenses being heavy. I really do not know
how much of this I shall recover. The
balances are very low and as I do not
want to draw (for obvious reasons) on our
associates here - although they virtually made
the offer - I would like you to use
the bonds and make deposits equally
to the credit of both companies. I

prefer if you would deposit cash.
as I come to New York in
shall take the bonds back and subscribe
for more.

Please drop me a line by
return mail.

With best regards

Sincerely yours

George Scheiff Esq.
17 Battery Place
N. Y.

Ch. Tash



September 25th 1917

My dear Mr. Scheiff,

Just a short statement in reply
to your letter received a few days
ago.

I did not encounter any
difficulties of moment, but very
important improvements have kept me
busy day and night.

As I stated in a dispatch
of even date my latest construction

promises to be a colossal success. I can be advantageously applied to other
have developed many new features of mechanisms which I have since long
great commercial value. You will be contemplated to build. This work will
pleased to know that my dynamic balancing is pushed vigorously as soon as I
secures perfect results never before return.
attained in any high speed machinery. In view of the pending large business
and I am expecting to get a good third, as you know, should mature about
present covering the method which should the middle of next month, I think it
be worth a lot of money. The timing advisable to they have until then.
is virtually done away with and the Besides there are several other
capacity of the machine has been doubled, projects under consideration which
besides making it cheaper and simpler, may be carried out at least in a
There is every reason to believe that preliminary way. I am very anxious
the outfit will not require attention to have this matter definitely disposed
for a couple of years or more. What of as we can positively count (from
is most important the advances made that I see) on one thousand machines a month



September 25th 1917

My dear Mr. Scherff,

I am a short statement in reply
to your letter received a few days
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I did not encounter any
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As I mailed in a dispatch
of even date my latest construction

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great commercial value. You will be con-
pleased to know that my dynamic telescopic
secures perfect results never before
attained in any high speed machinery,
and I am expecting to get a good third
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be worth a lot of money. The oiling
is virtually done away with and the period
capacity of the machine has been doubled, pro-
besides making it cheaper and simpler. May
There is every reason to believe that pre-
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cess.) can be advantageously applied to other
uses of mechanisms which I have since long
be contemplated to build. This work will
be believing be pushed vigorously as soon as I
return.

linery, In view of the pending large business
good which, as you know, should mature about
should the middle of next month, I think it
being advisable to stay here until then.

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ruffled projects under consideration which
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side that I see) on one thousand packages a month

But finances worry me a little, the
expenses being heavy. I really do not know
how much of this I shall recover. The
balances are very low and as I do not
want to draw (for obvious reasons) on our
associates here - although they virtually made
the offer - I would like you to use
the bonds and make deposits equally
for the credit of both companies. I

prefer if you would deposit cash. I
will come to New York as soon as I can
shall take the bonds back and subscribe
for more.

Please drop me a line by
return mail.

With best regards

Sincerely yours

George Scherff Esq.
17 Battery Place
N. Y.

Ch. Tash

and - perhaps, if it is not too much
of a sacrifice to deposit say \$200 --
for the account of the T.C.I. This will
be enough to make it unnecessary
for me to raise the question of money
until I am through, when they will
naturally have to approach me on
the matter & see you very soon with
the hope of seeing you

very yours

J. Tesla

Mr. George Scherff Esq.
17 Battery Place
(Union Sulphur Co) N.Y.



Apr. 7. 1917.

My dear Mr. Scherff,

You will probably understand that
it must have been business of the greatest
importance to keep us here so long and
spend so much money. The fact is that
the P.N.C. contemplates to stop the main-
feature of their old machines altogether,
at least the manager told me so. Further-
more they are convinced that the forty
thousand headlights already sold will have
to be soon or later replaced as they
are unsafe and the railroad people

are raising the and other objections business if I am successful not to speak
against their use. of other projects in connection. I am
Our business arrangements have been arranging for the demonstration before the
delayed until a demonstration is made Officials about middle of next week and
before prominent officials on their orders as I am confident of a veritable triumph
of not less than ten thousand machines are I am anxious not to touch on financial
hanging. The Company has also put on the market a 3 K.W. R.R. Lighting outfit and matter until then.
has an order for 500 of these but is hesitating. The funds in the Bank are
I proceed as the machine is not safe design for about \$7000.00 in the
expensive to build and takes too much wireless and also for an additional sum
steam. My turbo generator of 5 K.W. would as compensation in the future but
be barely one third the size and would save it will take time to collect the and
100 lbs. steam per hour. I have been therefore we must depend on the funds here
working hard ~~in~~ persuading them to for the present. What I would want you
adopt mine and think they will to do is to advance whatever their
As you see all this means big Skerritt will require Saturday next



Apr. 7. 1917.

My dear Mr. Scheff,

You will probably understand that it must have been business of the greatest importance to keep me here so long and spend as much money. The fact is that the P. N. Co. contemplates to stop the manufacture of their old machines altogether, at least the managers told me so. Furthermore they are convinced that the forty thousand headlights already sold will have to be worn or later replaced as they are unsafe and the railroad people

are raising their and other objections
against their use.

Our business arrangements have been
delayed until a demonstration is made
before prominent officials on which orders
of not less than ten thousand machines are
hanging. The Company has also put on the
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100 lbs. steam per hour. I have been
working hard ~~to~~ persuading them to
adopt mine and think they will.

As you see all this needs big

business if I am successful not to speak
of other projects in connection. I am
been arranging for the demonstration before the
made officials about middle of next week and
orders as I am confident of a veritable triumph
are I am cautious not to touch on financial
in the and matters until then.

watching over the funds in the Bank are.

We have of course a perfectly
safe claim for about \$7000⁰⁰ in the
old wireless and also for an additional sum
save as compensation in the patent suits but
it will take time to collect this and
therefore we must depend on the deeds here
for the present. What I would want you
to do is to advise whatever their
Skerritt will require Saturday next

and - perhaps, if it is not too much
of a sacrifice to deposit say \$200.00
for the account of the T. C. I. This will
be enough to make it unnecessary
for me to raise the question of money
until I am through, when they will
naturally have to approach me on
the matter.
Hoping to see you very soon with
the best news.

A. George Schaff Esq.
17 Battery Place
Union Sulphur Co. N. Y.

St. Paul

See sketch 27.
8 Nov 40. A. S.

Dear John
N. York

My dear Mr. Schuff,
I sent a few lines to supplement my
dispatch of yesterday.

Dec. 25, 1917



disputes of yesterday.
 Besides, however, you will find (in italics) copy
 of letter to P. S. C. which summarizes the important
 I have made. Paragraph 11 deals with the question
 referred to, proposed to be a colonial success. Not
 only does it repeat in the manner of a perfect
 centrifugal device of ideal simplicity but also in
 one for purposes unique and not desirable. In
 instance, it adjusts itself with a freedom to
 variations of pressure however great. To be applied,
 suppose that the sheep were on the locomotive

travels very far, say, to 250 lbs. in water in
activity, the more we have the absolute effect
on the speed or performance of the turbine. It
also indicates the rotating system always in
the condition of low friction resistance. This
proving them. In fact, on everybody says, it is
wonderful. I also says this device on all my
turbines which are perfectly simple the appa-
ratus and machine system.

Now as to business with the P.V. Co. matters
stand as follows

Payment of \$2000 = an extension of two op-
tions (foreign and domestic lighting) for one
month to date from completion of office
costs of my machine at their factory. There
will be made within a week. At the expiration
of the term they will have to carry out their
option with satisfactory and satisfaction as
provided in agreement. There is no doubt that

they will do it but my fight for another
about extension. They are not anxious to
start reconstruction and several meetings with
railroad men will be arranged as soon as
the office but not made. There are from
3000 to 3500 machine, woodwork in the steel
containing later.

You will recall that in addition to
what for \$2000 = recently forwarded to the
T.C. Inc. another for \$1000 = in the same
some time. The letter was in for
each advance made by me in the same
with them about my personal cooperation
and expenses incurred by myself as well
as on behalf of the Company and while
no definite conclusion has been reached I
believe they will try to be fair.
As all expenditures are away for



Dec. 25, 1917

My dear Mr. Schuff,

Just a few lines to supplement my
dispatch of yesterday.

Under inclosure you will find (in file) copy
of letter to P. N. Co. which enumerates the improvements
I have made. Paragraph 11 deals with the invention
referred to, proved to be a colossal success. Not
only does it regulate in the manner of a perfect
centrifugal device of ideal simplicity but that is
more for properties unique and most desirable. For
instance, it adjusts itself instantaneously to
variations of pressure however great. To be explicit
suppose that the steam pressure on the locomotive

could vary from say, 50 to 250 lbs. no matter how rapidly, this would not have the slightest effect on the speed or performance of the turbine. It also maintains the rotating system always in the condition of least frictional resistance thus saving steam. In fact, as everybody says, it is wonderful. I shall adopt this device on all my turbines which will greatly simplify the operation and insure success.

Now as to business with the P.W.C. matters stand as follows:

... 6th against a payment of \$2000⁰⁰ an extension of two options (foreign and domestic lighting) for one month to date from completion of official tests of my machine at their factory. These will be made within a week. At the expiration of the term they will have to carry out three options with cash payments and guarantees as provided in agreement. There is no doubt that

they short start rec'd the off 3000 counter check T.C. L. some cash and of the with the and exp as a no defi believe As

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they will do it but may fight for another
short extension. They are most anxious to
start manufacture and several meetings with
railroad men will be arranged as soon as
the official tests are made. There are from
3000 to 3500 machines involved in the deals
contemplated.

C. matters

two op-
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There

piration

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as believe

that

You will recall that in addition to
check for \$2000⁰⁰ recently forwarded to the
T. C. Inc. another for \$1000⁰⁰ was transmitted
some time before. The latter sum was for
cash advances made by me in the course
of the work. I have had a long wrangle
with them about my personal compensation
and expenses incurred by myself as well
as on behalf of the Company and while
no definite conclusion has been reached I
believe they will try to be fair.

All executives are away for

the week I may have to call on you
again but am pretty sure to be in
New York not later than Sunday after
hearing with the report of a long battle
fought and won.

Sincerely yours

Geo. Scheff Esq.

8 West 40 St.

N.Y.

N. T. Tash

My dear

dispute

P.S. In view of my early return
I think it best to postpone action
in the wireless cases until then. I find
however that you should be more fully
informed before proceeding. The claims
are perfectly safe.

of letter

I have

referred

only do

centrifuge

now for

instance

variation

suppose

difficult to say how soon I
shall be free. It looks as though
another week should see me through.

Geo. Scherff Esq.

Tesla Co Inc.

8 West 40 St. N.Y.

Yours sincerely

N. Tesla

P.S.

Please instruct his clerks that
the bill for 2000⁰⁰ forwarded should
be charged to our expense account.



Feb. 10. 1918.

My dear Mr. Scherff,

Just a few words in a hurry
to explain to you why I am
sticking here at the sacrifice of
all other interests.

The fact is I have developed
a big proposition. To state
briefly my machine will save
in coal and service alone about

one hundred dollars and, taking into consideration transport, closely on five hundred dollars per annum. This makes for 5000 machines already installed twenty five million dollars per year. As you see it is an important consideration for R. R. at this moment when economy is the keynote. I think that our business friends are now convinced of the soundness of my views and will act accordingly.

The lightning possibilities in other fields are now being investigated. At their request I have dictated

the enclosed to facilitate the work of their commercial department. I have no doubt whatever that they will take advantage of this rare opportunity. If so they will probably manufacture five thousand machines a month.

I am naturally very anxious about the Government work I have undertaken as I know that I am under great services just now. But people in Washington may not understand that I must first get the money to carry out my projects.

The work on details of manufacture keeps me still busy and it is



Feb. 10. 1918.

My dear Mr. Scherff,

Just a few words in a hurry
to explain to you why I am
sticking here at the sacrifice of
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The fact is I have developed
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as I know that I can render great
services just now. But people in Washington
may not understand that I must first
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projects.

The work on details of manufacture
keeps me still busy and it is

difficult to say how soon I
shall be free. It looks as though
another week should see me through.

Geo. Scherff Esq.
Tasle Co Inc.

Yours sincerely

F West 40 Str. N.Y.

N. Tesle

P.S.

Please instruct him Herriott that
the cost of 2000 ⁰⁰ forwarded should
be charged to our expense account

My

to exp
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March 14th 1914

Dear Mr. Scherff,

Inclosure please find tax reports
signed as requested.

Have no time to write only to
tell you that we are hard at work
to deliver first machine within ten
days.

See you soon.

With regards

Es. Scherff Esq.

8 West 40 Str.

New York

Sincerely

A. Tash



March 11. 1918

Dear Mr. Scherff,

Your letter of 9th inst. with
enclosure just received. The letter
has interested me greatly, of course;
also gives me some regret that I
have not accomplished more. However,
the present prospects are very bright
and I am confident that your
next statement will be quite different.



March 11. 1918

Dear Mr. Scherff,

Your letter of 9th inst. with
enclosure just received. The letter

has interested me greatly, of course;

also gives me some regret that I

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Dear Mr
Jo
enclosure
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also given
have not
the present
and I
rest the

NIKOLA TESLA
COMPANY

8 West 40th St.
TEL. 9090 BRYANT
NEW YORK

March 8, 1923

Dear Mr. Scherff,

According to information you furnished some time ago we may assume that the full time (24 h.) operation of eight wells necessitates at present a daily consumption of 4000 barrels of oil which is usually rated at 18000 heat units per pound. Each barrel containing about 42 gallons, the total quantity of oil burned each 24 hours will be, roughly, $4000 \times 42 \times 8$ pounds. Hence the whole heat energy developed in the combustion is -

$$H = 4000 \times 42 \times 8 \times 18000 = 24192000000 \text{ heat units.}$$

Now the water supplied from the heaters or "boilers" is from 4500 to 5000 gallons per minute. Taking the bigger figure (which will show higher efficiency) the entire quantity of water supplied to the eight wells in 24 hours is about $5000 \times 8 \times 60 \times 24 = 57600000$ pounds. Mr. Keenan testified that the temperature of delivery is almost invariably 285°.


and as the water enters the "boilers" at about 70° the increase in its temperature $285 - 70 = 215^{\circ}$; Consequently, the heat of the fuel imparts to the water a quantity equal to

$$h = 57600000 \times 215 = 12384000000 \text{ heat units.}$$

The ratio $\frac{100 \times h}{H} = \frac{100 \times 12384000000}{24192000000} = 51.2 \text{ percent.}$ As the bigger figure of 5000 gallons per minute was assumed it is safer to conclude that the heat actually supplied to the eight wells is less than fifty percent of that developed by the fuel. Note first that in my process twice as much will be furnished from the same quantity of oil.

But there are other considerations of equal if not greater importance and I shall dwell on two of them.

The water is ejected from the wells at a temperature of $170^{\circ} - 190^{\circ}$, say, 180° on the average and a very large portion of the heat is thus thrown away. In my process I can use this hot water over and over so that instead of heating it from 70° to 285° as at present I shall have to warm it up from 180° to 285° . In other words, while each pound of water requires now a heat supply of $285 - 70 = 215$ heat units as above pointed out, I shall need only $285 - 180 = 105$ heat units or less than one half to produce the same effect with each pound of water. Theoretically, then, I shall



NIKOLA TESLA COMPANY

8 West 40th St.
TEL. 9090 BRYANT
NEW YORK

require only one quarter of the quantity of oil burned
at present.

But another fact may be, perhaps, of still greater
significance.

Your figures show that eight wells calling for a
fuel consumption of 4000 barrels daily in continuous
operation will yield about 3000 tons of sulphur each
24 hours. Sulphur melts at 239° and the latent heat
of fusion is about 19 heat units. The specific heat
being 0.2 each pound of sulphur requires for lique-
faction $239 \times 0.2 + 19 =$ (nearly) 67 heat units, therefore
all the heat consumed in the fusion during 24 hours is

$$h' = 3000 \times 2200 \times 67 = 442200000 \text{ heat units.}$$

The ratio $\frac{100 \times h'}{h} = \frac{100 \times 442200000}{12384000000} = 3.57 \text{ per cent}$

which means to say that if the heat actually applied

$100 - 3.57 = 96.43$ percent is wasted, or

$100 - \frac{3.57}{2} = 100 - 1.785 = 98.215$ percent of the

heat developed by combustion of the oil. In view
of this enormous waste at the locus of operation
an improvement in the efficiency of ^{transmission} of heat to the
sulphur is of extreme importance. I believe
that, working as I propose, instead of wasting
96.43 percents of the applied heat as at present
this loss will be reduced to possibly 92.86 percent
and that would mean that I may produce with one
eighth of the fuel the same results which are
now obtained. That is, to say, the diurnal saving
might be about 3500 barrels. Of course, I
would not vouch for such results but the theory
is sound and they would not surprise me.

You might mention these facts to Mr. Whiston
(not forgetting my caution) when you take up the
subject with him.

Yours very truly

N. Tesla

Geo. Scharff, Eng.

Union Sulphur Co

33 Rector St. N.Y.

NIKOLA TESLA
COMPANY

8 West 40th St.
TEL. 9090 BRYANT

NEW YORK

March 6, 1923

Dear Mr. Scherff,

According to information you furnished some time ago we may assume that the full time (24 h.) operation of eight wells necessitates at present a daily consumption of 4000 barrels of oil which is usually rated at 18000 heat units per pound. Each barrel containing about 42 gallons, the total quantity of oil burned each 24 hours will be, roughly, $4000 \times 42 \times 8$ pounds. Hence the whole heat energy developed in the combustion is -

$$H = 4000 \times 42 \times 8 \times 18000 = 24192000000 \text{ heat units.}$$

Now the water supplied from the heaters or "boilers" is from 4500 to 5000 gallons per minute. Taking the bigger figure (which will show higher efficiency) the entire quantity of water supplied to the eight wells in 24 hours is about $5000 \times 8 \times 60 \times 24 = 57600000$ pounds. Mr. Keever testified that the temperature of delivery is almost invariably 285°.


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The ratio $\frac{100 \times h}{H} = \frac{100 \times 12384000000}{24192000000} = 51.2 \text{ percent.}$ As the
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safe to conclude that the heat actually supplied to the eight
wells is less than fifty percent of that developed by the fuel.
Note first that in my process twice as much will be
furnished from the same quantity of oil.

But there are other considerations of equal if not greater
importance and I shall dwell on two of them.

The water is ejected from the wells at a temperature
of $170^{\circ} - 190^{\circ}$, say, 180° on the average and a very large
portion of the heat is thus thrown away. In my process
I can use this hot water over and over so that instead
of heating it from 70° to 285° as at present I shall have
to warm it up from 180° to 285° . In other words, while
each pound of water requires now a heat supply of
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NIKOLA TESLA COMPANY

8 West 40th St.
TEL. 9090 BRYANT
NEW YORK



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Your figures show that eight wells calling for a
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all the heat consumed in the fusion during 24 hours is

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sulphur is of extreme importance. I believe
that, working as I propose, instead of wasting
96.43 percent of the applied heat as at present
this loss will be reduced to possibly 92.86 percent
and that would mean that I may produce with one
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might be about 3500 barrels. Of course, I
would not vouch for such results but the theory
is sound and they would not surprise me.

You might mention these facts to Mr. Whiton
(not forgetting my caution) when you take up the
subject with him.

Yours very truly

Geo. Scherff, Eng.
Union Sulphur Co.
33 Rector St. N.Y.

N. Tesla

We want a modification
 color in the arrange-
 ment of the valves
 and ganges. It will
 be necessary to have a
 pressure indicator close
 to the boiler.

The Waldorf-Astoria
 New York.

Aug. 16. 1901

Dear Mr. Schaff,

Your letter received.
 I have called meeting
 all details about
 a visit this for next
 to be arranged
 I mean. The
 drawing will
 be ready by next
 week. I have
 begun.

